The benefits and challenges of employing new sonography graduates: Key stakeholder views

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The Benefits and Challenges of Employing New Sonography Graduates: Key Stakeholder Views

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Abstract

The impetus for this work was the increasing concern over the national sonographer workforce deficit. Despite this, demand for ultrasound services continued to increase with current educational models only facilitating small numbers of trainees at any given time. At the time of writing this first line investigative modality was nearing crisis and there was an urgent need for different education models and service reconfiguration.

Aim: This study explored the perceptions of key stakeholders in relation to employability of a new sonographer graduate after proposed completion of a direct entry, undergraduate programme of study. The aim of the research was to gain a deeper understanding of the current perceptions of key stakeholders related to employing new sonography graduates.

Method: Semi structured interviews were used and a total of thirteen participants interviewed. The data collected was analysed using a constructivist Grounded Theory approach and emerging theory tested. The qualitative approach allowed rich and detailed exploration of the participants' perceptions.

Findings: An overarching theory emerged related to 'striving for professional identity' with three categories; achieving professionalism, being in control and managing change. Much resistance to change and protection of their own roles emerged as did the lack of clarity for the role, career structure and pay. Some of this was attributable to the historical development of radiography and sonography and associated with maintaining professional boundaries. The findings also suggested that the challenges of employing a new sonographer graduate were much more deeply rooted. It highlighted sonography lacked some of the key requirements for professionalisation and the professional identity and recognition were weak.

Conclusions: Patterns and subsequent theory emerged from which potential solutions and recommendations were made. The research identified there was an urgent need for change and proposed this could be achieved through clear leadership to manage and implement the changes. The key aspects related to professionalisation and professional identity needed to be strengthened through the introduction of a direct entry programme, robust entry requirements and curriculum, career structure, registration and leadership.

Candidate's Statement

I declare that this work has been conducted in accordance with the regulations of Sheffield Hallam University and is the author's own work apart from where indicated by specific reference to other sources. The work has not been submitted as part of any other award or presented to any other institution.

Trudy Sevens 22/03/2017.

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Glossary

Sonography graduate	Someone who has completed a direct entry programme of study to achieve an undergraduate BSc (Hons) in ultrasound
Constructionism	Meaning making of the world through interpersonal/social collective interactions. Meaning is constructed, not discovered.
Constructivism	Individual meaning making according to individual experiences and intrapersonal interactions. Meaning is constructed, not discovered.
Critical theory	The exploration of historical and cultural contexts by the use of questioning or critique.
Epistemology	The theory of knowledge and how we know what we know. Concerned with the relationship between the knower and what is known.
Interpretivism	The belief that interpretations of the social world are culturally derived and historically sited. There are multiple realities.
Objectivism	The belief that truth exists independently from human perception or imposed meaning.
Positivism	Objective systematic observation or experimentation to discover and explain the studied.
Realism	The belief that realities exist outside of the mind and are independent of human action and observation.
Relativism	The belief that the external world exists as a result of our thoughts and interpretations.
Subjectivism	The belief that knowledge is subjective and there is no objective truth. Meaning is imposed on the object by the subject

1 Chapter One - Introduction

1.1 Historical context

A high proportion of the sonographer workforce have undertaken postgraduate development from a radiographic background (British Medical Ultrasound Society, (BMUS), n.d.a; Centre for Workforce Intelligence, (CfWI), 2017) which can be attributed to ultrasound being an imaging modality and traditionally falling under the Radiology directorate. This has led to blurring of professional boundaries, although some authors would argue that this has always been the case for radiography (Nancarrow & Borthwick, 2005; Price & Le Masurier, 2007) and can be attributed to some extent to the historical context of the development of the profession. An overview of the development of the radiographer workforce is therefore useful to explore with further expansion to the historical development of ultrasound.

1.1.1 Radiography historical context

X-rays were found to be medically useful in 1896 by Roentgen. The interpretation of the images produced was deemed outside the remit of the surgeon and hence the medical specialism of radiology was formed with medically trained 'radiographers' producing and interpreting the images. However, the role was poorly respected by medical colleagues and accusations were made of picture takers rather than consultants (Larkin, 1983). Also around this time the 'lay radiographer' (non medically trained) emerged who was perceived as resourceful, cheaper and more easily accessible as they worked with portable pieces of X-ray equipment in the back of a van. Radiography, as we know it, was born as a result of the delegation of routine and tedious activities by radiologists attempting to gain higher status with other medical colleagues (Ferris 2005). The transition, however, was not smooth with many 'lay radiographers' continuing to offer verbal comments on image interpretation to surgeons. In an attempt to curb this, the radiologists formed and led the Society of Radiographers (SoR) in 1920 (Larkin, 1983).The SoR stated that 'lay radiographers' were not allowed to report their judgements and anyone doing so would be 'struck off' and excluded from the SoR. To reinforce this in 1939 the British Medical Association (BMA) recommended that radiographers should be

placed under the direct supervision of radiologists and it wasn't until the 1960's radiography was recognised as a profession by the Professions Supplementary to Medicine (Professions Supplementary to Medicine Act, 1960).

This delegation of tasks or roles to radiographers from medically trained radiologists has created opportunities for radiographers. The advancement of radiographer roles has been emphasised by the national workforce deficit of radiologists (Cancer Research UK, 2015; Royal College of Radiologists, 2014 and 2015; White & McKay, 2004;) prompting delegation of what could be considered the more mundane, or less desirable tasks, to a subordinate group (Larkin, 1983; Witz, 1992). However, Hardy et al (2008) claimed that advancement of roles should be focussed on service evaluation and improvements and examples include report writing and interventional procedures as well as performing and reporting ultrasound examinations, especially those associated with screening. Radiographers have 'stepped up' to this challenge and deliver high quality services for example, the accuracy of radiographer reporting being comparable to radiologist reporting is well documented (Bates et al., 2003; Hart & Dixon, 2008; Leslie, Lockyer, & Virjee, 2000; Murphy et al, 2002).

1.1.2 Sonography historical context

Ultrasound was first used in the early 1900's as a therapeutic treatment due to the biological effects associated with heating of, and potential damage to, tissues. In the 1940's it was claimed ultrasound was a 'cure all' and was used to treat a wide variety of medical conditions such as eczema, arthritis, angina and urinary incontinence (Woo, n.d.). The first diagnostic use was published in 1942 by Dr Dussik, (Baker, 2005; Gibbs, 2013; Levi, cited in Northouse, 2015; Newman & Rozycki, 1998) an Austrian neurologist; followed by a paper in the Lancet in the 1958, which was considered to be probably the most important publication on medical diagnostic ultrasound ever published (BMUS, n.d.b). Both of these led to the rapid use and development of ultrasound in diagnostics. The first B mode ultrasound machine (a precursor to modern equipment) was manufactured in 1951 as the first handheld contact scanner (Baker, 2005; Jensen, 2007) and was subsequently used in 1956 by Donald to obtain fetal

measurements which could be correlated to fetal weight and gestational age (Baker, 2005).

The majority of antenatal scanning continued to be performed by radiologists up until the early 1970's (Hart & Dixon, 2008). At this time there was a rapid expansion in the clinical applications for ultrasound and service demand which created an opportunity for radiographers to train and expand their roles to include performing some basic obstetric dating scans (ibid). By the mid 1980's, the majority of obstetric scans and a proportion of abdominal scans were performed by radiographers (Edwards, cited in Hart & Dixon, 2008).

The development of ultrasound services with heavy reliance on sonographers is well established, with a high proportion of staff employed within England at advanced practitioner level, supported by postgraduate education. One could argue this was as a result of the existing sonographer role being matched against the Agenda for Change band 7 profile in the Department of Health (DoH) review in 2008. This created a band 7 (advanced practice) and above workforce with no clear onward career structure or progression. It is acknowledged that sonographers led the way for radiographer advanced practice and role extension with the delegation from radiologists to radiographers of performing and reporting ultrasound scans (Hart & Dixon, 2008) as aforementioned. However, sonographer role extension has not kept up with their radiographer counterparts and role extension for sonographers reached a plateau in the mid 1990's (ibid).

1.1.3 Education historical context

The first ultrasound educational model was introduced in 1977 by the Society and College of Radiographers (SCoR) as a Diploma in Medical Ultrasound (DMU) (Price, 2010). This Diploma mirrored the level of education at that time for Diagnostic Radiographers and allowed radiographers undertaking ultrasound examinations to achieve a formal qualification to demonstrate a standardised level of competence had been achieved in a new imaging modality. During the 1990's a new sonography educational route was developed and introduced. It can be argued that again this was following the change in Diagnostic Radiography education, as the Diploma of the College of Radiographers (DCR) was replaced by a BSc (Hons) Diagnostic Radiography in

the early 1990's (Price, 2010). Ultrasound was perceived as a separate speciality role and postgraduate education supported this within Higher Education Institutes (HEIs). The only exception to this occurred in very focussed areas of ultrasound being performed by technicians at a much lower banding (Bates et al., 2003; SCoR, 2009; Thomson, 2015b). These technicians emerged as a result of the Abdominal Aortic Aneurysm screening programme and are supervised, undertaking very protocol driven work (Public Health England, 2016).

Whilst Diagnostic Radiography education benefitted from clearly defined first post competencies from both the professional body (SCoR) and from the Standards of Education (SETs) (HCPC, 2014a) and Standards of Proficiency (SOPs) (HCPC, 2013) from the regulatory body, the HCPC, these were not as clearly defined for ultrasound education. In the absence of both a professional and regulatory body, the United Kingdom Association of Sonographers (UKAS) was established in 1990 by the merger of the British Sonographers Association (BSA) and the National Association of Sonographers (NAS) (W. Williams, personal communication, 2017). They produced guidelines for sonographers and educationalists alike to follow a set of standards for clinical competencies, education, equipment use and so on. These are used alongside published guidance to define the sonographer competencies (SCoR & RCR, 2012; Thomson, 2009; UKAS, 2008). In addition, to these publications, the Consortium for the Accreditation of Sonography Education (CASE) was established in 1993 (Gibbs, 2013) to monitor and approve ultrasound programmes offered by HEIs. This was in an attempt to try and standardise sonography education nationally which Edwards (2010) claimed was still lacking. Gibbs (2013) concurred with this and argued that there was still a lack of standardisation of sonography education nationally despite the importance of this for patient safety. She stated that, despite calls from the Chief Medical Officer in 1984, for adequate standards to be set for training,'there is still no overarching education and training framework available for all individuals wanting to undertake ultrasound examinations'. (Gibbs, 2013, p. 166).

This undoubtedly raises concerns as to quality assurance for the public in terms of safe practice.

1.2 Current challenges

1.2.1 Educational model

The current postgraduate training models only facilitate small numbers of trainee sonographers at any given time due to the intensive nature of training to develop a new clinical skill alongside Masters level study. Ultrasound requires development of additional and new psychomotor skills and manual dexterity which have not been previously learnt from a radiographic, nursing or midwifery background for example. There is immense strain on the clinical departments to provide one to one support for ultrasound training with the sonographer shortage, reliance on agency staff within departments and increasing service demands. Clinical mentors increasingly report, anecdotally, the constant 'juggling' act between training students and meeting service demands for ultrasound examinations. Whilst documents have been produced highlighting best practice for ultrasound training (HEEM, 2013) in reality, departments struggle to adhere to them or even to offer any trainee places at all. Placement capacity, is therefore, a major limiter to the number of ultrasound trainees that can be accommodated in a department (Parker & Harrison, 2015). Attempts to supplement this with ultrasound simulation have been trialled and are currently being evaluated further. It is acknowledged that little research has been undertaken to date evaluating the effectiveness of ultrasound simulation in healthcare education (Dickson, 2015; Gibbs, 2014 and 2015). However, the positive impact on the student experience is recognised, as is the increase in student's confidence when they subsequently attended the clinical placement (Gibbs, 2014 and 2015; Martin, 2014; Reid-Searl, Bowman, McAllister, Cowling, & Spuur, 2014).

Different educational models are being explored but key to this is that any sonographer trainee graduating after undertaking a different educational model to that currently on offer, must be employable.

1.2.2 Increasing demand

Ultrasound is an imaging modality which utilises high frequency acoustic sound waves to visualise body structures. It is considered a relatively safe imaging modality as there is no ionising radiation used to obtain traditional radiographs

as in Computed Tomography (CT) scanning for example. Ultrasound also has a high patient acceptability due to minimal patient preparation required for a simple examination compared to Magnetic Resonance Imaging (MRI) for example, which often requires the use of contrast agents and enclosure within a restricted space. These all contribute to the increasing demand for ultrasound examinations within the clinical setting, often as the first line investigation, due to the introduction of new national screening and care-pathways that involve imaging at their core. Examples of national screening programmes currently implemented include the Fetal Anomaly Screening Program (Public Health England, 2015) and the Abdominal Aortic Aneurysm Screening Program (Public Health England, 2016). In addition, there has been an expansion of ultrasound services from the traditional acute hospital Trust settings into the community and primary care environments, independent and private care settings.

This increasing demand for ultrasound examinations and expansion of services places increasing pressure on the ultrasound workforce.

1.2.3 Regulation

Currently, the term 'sonographer' is not a protected title and is not subject to professional or regulatory body regulation, despite this being the preferred route by all in the interests of public safety (Gibbs, 2013; Health Professions Council (HPC), 2009; SCoR, 2013; Thomson, 2009). However, regulation of sonographers by the Health and Care Professions Council (HCPC) is not imminent (Gibbs, 2013; Secretary of State, 2011) and the SCoR (SCoR, 2013; Thomson, 2009) advocated that this should not be seen as a pre requisite for the development of a direct entry BSc (Hons) in Ultrasound route. They do, however, recognise that it is paramount that any new Sonographer graduates must be employable. A recent survey by the SCoR (Thomson, 2014) of United Kingdom (UK) ultrasound departments reported that 75% of Trusts did not employ sonographers who were not registered with a regulatory body. This is despite the Government's paper, 'Reducing Regulation Made Simple' (2011) outlining their commitments to reducing regulation to allow increases in professional freedom in the workplace. The aspiration was to allow greater independence for employers and employees in health care, providing more 'effective accountability for how they exercise that freedom. In doing so they will

also provide more effective assurance of the quality of unregulated staff.' (Secretary of State, 2011, p. 4)

This paper also argued that most cases of individual failings were better dealt with by effective leadership locally rather than regulation (ibid). The Government therefore, recommended the use of a voluntary register for those occupational groups that were unregulated. The SCoR and UKAS established such a voluntary register in 2007.

1.3 Development of the speciality

1.3.1 Regulation

Traditionally, the majority of ultrasound examinations are performed under the Radiology directorate by 'sonographers'. The British Medical Ultrasound Society (BMUS) reported that the 'majority of sonographers who are employed in the United Kingdom come from a background of radiography or midwifery' (BMUS, n.d.a).

The term sonographer however, is not a protected title or regulated by a professional or regulatory body but rather one that has been adopted by a diverse group of health care professionals undertaking ultrasound examinations to identify their specialist skills. This is despite much work being conducted to gain this recognition (HPC, 2009; SCoR, 2009 and 2013). The SCoR and BMUS (2016) define a sonographer as someone working within ultrasound who holds, as a minimum, a Postgraduate Certificate in ultrasound from a CASE approved course.

There is therefore, heavy reliance on the fact that these radiographers (and other health professions such as midwives performing ultrasound examinations), maintain registration and are regulated by their associated regulatory body, that is, either the Health and Care Professions Council (HCPC) or the Nursing and Midwifery Council (NMC) (BMUS, n.d.a; Thomson, 2014). This is advocated by the professional body of radiographers, the Society and College of Radiographers (SCoR). In addition, they recommend their members performing ultrasound examinations maintain their professional registration with

them (Thomson, 2014) and register with the voluntary sonographer register they introduced in 2007 (Lee & Paterson, 2004; Secretary of State, 2011). Despite this reliance on professionals maintaining registration within their original profession, it is not a mandatory requirement due to the diverse range of health care staff utilising ultrasound and the term 'sonographer' not being a protected title. Therefore, there are also sonographers employed within the NHS who are not registered or regulated by any professional or regulatory body, for example, those who have pursued a career through the medical technical officer or clinical scientist route.

There is also lack of regulation associated with who is allowed to purchase an ultrasound machine. Currently, within the UK there are no regulations, requirements or restrictions on the purchase and use of ultrasound equipment. In practice this means that anyone can purchase and use an ultrasound machine without any formal training or knowledge of the safety aspects or working of the machine (Ashton, 2006; Paterson, 2008).

1.3.1.1 Advanced Practice

The majority of the current sonography workforce are employed at advanced or specialist practitioner level in England holding band 7 posts as a result of the Agenda for Change role profiling (DoH, 2008). Nancarrow and Borthwick (2005) maintained that advanced practice roles are key to developing new models of care to meet future service demands. It is also acknowledged advanced practice roles improve service delivery and patient centred care along with increasing leadership and research activity (Begley et al, 2013). In order to facilitate this for radiography, the SCoR introduced a national research forum in 2002 and subsequently, the consultant radiographers group in 2006 to drive these agendas forward. However, a relatively small number of advanced or specialist radiographer practitioners progress to consultant practitioner level with only 84 consultant radiographer posts nationally with 15 of these being consultant sonographers (SCoR, n.d.c).

1.3.2 Workforce deficit

The ongoing deficit in the current ultrasound workforce is evident in recent publications and is demonstrated in the table below.

Publication	National deficit	Local deficit
Centre for Workforce Intelligence, 2012	11%	
Society and College of Radiographers, 2014	18%	
Centre for Workforce Intelligence, 2017	10%	
Health Education East Midlands, 2013		20%
Health Education East Midlands, 2015		18%

Table 1 Workforce deficit

The most recent figures from the CfWI (2017) reported the national vacancy rate as 10% as of December 2015. This is marginally improved from the 11% they reported in their 2012 publication. The SCoR (Thomson, 2014) reported a slightly higher deficit of 18% in 2014 with 61% of departments carrying vacant posts. However, it is acknowledged that the response rate for the SCoR survey (Thomson, 2014) was only 28% and the CfWI (2017) stated they were unable to quantify their actual response rate.

Local data collection indicated a similar scenario with local deficits being reported at 20% in 2013 and 18% in 2015 (local Health Education England (HEE) data analyses, Health Education East Midlands (HEEM) 2013 and 2015).

At the time of writing, many regional Trusts were utilising vacancy monies to fund training posts as the increasing demand for ultrasound services outweighs the current sonographer supply through the existing educational models. A high proportion of sonographers being trained are therefore already counted towards upskilling the existing establishment rather than contributing towards a true increase in the workforce. Training posts are typically funded through qualified sonographer vacancy money (Bates, Deane & Lindsell, 2003; HEEM Sonography Workforce and Education Development project workforce intelligence data, 2013; Thomson, 2009 and 2014).

The most recent data available from the Consortium for Accreditation of Sonography Education (CASE, 2016) is detailed in the table below.

	Students enrolled				Students obtaining award			
	PgC	**PgD**	**MSc**	**Total**	**PgC**	**PgD**	**MSc**	**Total**
2014-15	286	177	59	522	190	169	36	395
2013-14	268	262	101	631	141	148	42	331
2012-13	251	207	91	549	152	106	38	296
2011-12	260	273	97	630	150	133	42	325
2010-11	290	240	62	592	186	149	28	363

Table 2 CASE training figures
http://pages.omkt.co/archive/bWVzc2FnZV8yODk1MTY1XzE1NDZfMzQyXzIwMDEx

The figures within the PgC columns represent 'new' trainees as the ones depicted in the PgD and MSc columns are existing sonographers, extending their skills and awards. Therefore, for the most recent data available for the academic year 2014-15, from a total of 522 students enrolled, only 286 of these were new trainees that would contribute to increasing the workforce. This equates to just under 55% of all enrolled trainees already being qualified sonographers upskilling. The figures of new trainees completing the courses and gaining the awards is however, disappointing. If we consider 'new' sonographers, 286 enrolled but only 190 completed, 66% of 'new' sonographer trainees completed but only 36% of all enrolled students completed and contributed to an increase in workforce. Whilst there was a slight improvement on the figures for 2013-14, (268 enrolled, 141 (53%) completed and 22% increase in workforce), these figures are ineffective to sustain the workforce.

The sonography workforce deficit has been exacerbated by many experienced sonographers migrating from the NHS into the private and independent settings resulting in massive agency staff spends to meet targets (CfWI, 2017; HEEM, 2015). In addition, the aging sonographer workforce and high incidence of work related musculoskeletal disorders (WRMSD) amongst sonographers (Bates et al., 2003) created an even greater urgency for change in both the educational models on offer and the workforce structure as a whole (please refer to historical context in section 1.1).

In addition, the CfWI (2017) reported that 80% of the sonographer workforce were women and 33% of this occupational group were over the age of 50 years old. This picture was also reflected in an earlier report by the SCoR (Thomson, 2014) who found that nearly a third (30%) of all sonographers nationally were over the age of 50 years old and a further 3rd (33%) between 41 and 50 years of age. This concurred with the local data analysis from HEEM (2013) of an aging workforce with 28% of all sonographers over 50 years old and 49% of sonographers in the age group 41-50 years old.

Sonography remains on the Migration Advisory Committee Occupation shortage list (www.gov.uk).

1.4 Conclusions

In view of the above, the impetus for this work was the increasing concern over the national sonographer workforce deficit. Despite this shortfall in workforce, the demand for ultrasound services continued to increase with current educational models only facilitating small numbers of trainees at any given time. In addition, the existing workforce was shown to be an aging workforce with no clear succession plan. This first line investigative modality was nearing crisis.

One potential solution is the introduction of a new sonographer graduate who has completed a direct entry BSc (Hons) Ultrasound programme. As sonographer graduates and the associated educational models have not previously existed, there is no existing theory or policy, although the work in this area is gaining momentum.

Any new graduate must be employable; the successful employability of a new sonographer graduate would require a service reconfiguration and shift in professional attitude for these new graduates to be successfully employed, valued and integrated into the current workforce. To facilitate this, a deeper understanding of the perceptions and opinions of the current stakeholders is essential to understand the potential benefits and barriers.

The SCoR was calling for this service re-alignment with effective leadership to embrace this change as far back as 2010 (Freeman, 2010). The author hopes this research study will strengthen the case and pave the way for both.

1.5 Aims and Objectives

The aim of the research is to gain a deeper understanding of the current perceptions of key stakeholders relating to employing new sonography graduates. This will allow patterns to emerge and subsequent theory from which potential recommendations can be made.

The objectives of the research are to -

- Explore any perceived issues relating to the employability of the new sonography graduates
- Recommend solutions for overcoming the perceived issues of employing the new sonography graduates

1.6 Research Question

What are the perceived benefits and challenges of employing a new sonographer graduate from the perspective of key stakeholders?

2 Chapter Two - Literature review

2.1 Introduction

There is much debate as to when and how much initial literature searching should be undertaken in Grounded Theory research (McGhee, Marland & Atkinson, 2007). Two main schools of thought emerged between Glaser and Strauss and the debate continues to date (Thistoll, Hooper & Pauleen, 2016). Glaser (1992) advocated that it should occur after data collection so as not to influence the researcher in any way, whereas Strauss (1987) believed initial reading is essential to set the context followed by substantive reading after data collection (Thistoll et al, 2016). Strauss and Corbin (1990) developed five main reasons for conducting an initial literature review which included -

- to stimulate theoretical sensitivity;
- to provide a secondary source of data;
- to stimulate questions;
- to direct theoretical sampling;
- to provide supplementary validity.

(McGhee, Marland, & Atkinson, 2007).

Charmaz (2012) also advocated a preliminary literature review which may cross occupational groups to both strengthen the research argument and credibility, proving it is 'sharply focused'. This was evident during the memo writing as comparisons were drawn from nursing, midwifery and medicine, for example. Hutchinson (cited in Giles, King & De Lacey, 2013) followed Strauss' notion and stated the literature review should be completed prior to any data collection or analysis and by doing so helps to provide a rationale for the research as well as identify gaps in current knowledge.

An initial literature search was performed to set the context for this research and represented a starting point. It was also used as a source of inspiration for ideas and critical reflections (Wertz et al, 2011). As the data analysis and research progressed utilising a constructivist grounded theory approach, additional literature was sought to support emerging theory. The initial search was repeated following data collection as recommended by Thistoll, Hooper &

Pauleen (2016) and Charmaz (2006). In addition, a RSS feed was set up to alert to any new material. The literature was then used to enhance rather than constrain the theoretical development.

Giles, King and De Lacey (2013) concurred with the view of conducting an early literature review and believed it enhances theoretical sensitivity and rigour whilst guarding against introducing researcher perspective from preconceived ideas.

2.1.1 Theoretical sensitivity

Theoretical sensitivity has been defined as being sensitive to the underlying meaning of the data (Thistoll et al., 2016) and allows the researcher to think about the data collated in theoretical terms (Strauss, 1987 in Thistoll et al., 2016). Both Glaser (1992) and Strauss (1987) acknowledged the importance of the researcher being sensitive to the topic area through their own professional experience or knowledge, providing valuable insight which can give meaning to the data and identify relevant and irrelevant data (Gerrish & Lacey, 2010; Giles et al, 2013; Strauss & Corbin, 1990; Strauss & Corbin, 1998). It also allows the researcher to understand the significance of things quicker and to see connections between the different concepts (Corbin & Strauss, 2015). In order to do this the researcher's theoretical sensitivity should be well developed and used as early in the research journey as possible (Giles et al., 2013; Hallberg, 2010; McGhee et al., 2007; Thistoll et al., 2016). As aforementioned an early literature review can facilitate this, whilst avoiding formulation of premature ideas or hypotheses (Carpenter, 1999; Gibson, 2007; Lempert, 2007; McGhee et al., 2007; Thistoll et al., 2016). The author acknowledged her own theoretical sensitivity early in the research process and used reflection and reflexivity to explore this which is documented in the reflexivity chapter.

2.2 Search strategy

A systematic approach to literature searching was implemented with each step documented to promote clarity, validity and auditability (Booth, Papioannou & Sutton, 2012) and avoid misleading conclusions (Aveyard, 2014). Systematic approaches utilised in the searching for literature included using a broad range

of sources and being transparent by including the search terms and syntax included in the search strategy.

To identify relevant search terms and syntax, the initial research question was broken down into Population, Intervention (or exposure), Comparison, Outcomes and Context (PICOC) (Fineout-Overholt & Johnston 2005). Whilst it is recognised it is usual to use this system for development of the research question, it was thought useful to help identify suitable search terms.

PICOC	**Search terms**
Population	- new sonography graduates
Intervention (or exposure)	- employment of new graduates after successful completion of a direct entry route
Comparison	- current sonography employment
Outcomes	- successful employment of new graduates
Context -	- the future United Kingdom (UK) sonography workforce.

The initial research question used to guide the literature review was

> *What are the perceptions of key stakeholders regarding the employment of new sonography graduates?*

A broad approach to searching was utilised to identify anything and everything that might be of relevance. The rationale for this was to be all inclusive but also because of the perception that there might be a relatively small amount of published research/literature on this topic area.

The search strategy used a wide range of terms and comprised of four main search terms or groups of terms, relating to:

- education
- sonographer(y) and ultrasound
- employment and employability
- workforce

The table below demonstrates an example of the search terms. The full search strategy can be found in appendix 1.

	CINAHL	**Medline**	**British Education Index**
Education	(MH "Education, Diagnostic Medical Sonography")	TI (MH "Education, Diagnostic Medical Sonography") OR AB (MH "Education, Diagnostic Medical Sonography")	
	TI education OR AB education	TI education OR AB education	TI education OR AB education
	(MH "Students, Undergraduate") TI ("direct entry" or degree or bsc or undergraduate*) OR AB ("direct entry" or degree or bsc or undergraduate*)	TI (("direct entry" or degree or bsc or undergraduate*) OR AB (("direct entry" or degree or bsc or undergraduate*)	TI ("direct entry" or degree or bsc or undergraduate*) OR AB ("direct entry" or degree or bsc or undergraduate*) OR AB ("direct entry" or degree or bsc or undergraduate*) OR AB ("direct entry" or degree or bsc or undergraduate*)
Ultrasound	(MH "Ultrasonography+") OR (MH "Ultrasound Technologists") TI ultrasound OR AB ultrasound	TI (MH "Ultrasonography+") OR (MH "Ultrasound Technologists")) OR AB (MH "Ultrasonography+") OR (MH "Ultrasound Technologists"))	TI ultrasound OR AB ultrasound TI ultrasono* OR AB ultrasono*
Sonography	TI sonograph* OR AB sonograph*	TI sonograph* OR AB sonograph*	TI sonograph* OR AB sonograph*
Employability	TI employ* OR AB employ*	TI employ* OR AB employ*	TI employ* OR AB employ*
Workforce	TI workforce OR AB workforce	TI workforce OR AB workforce	TI workforce OR AB workforce

Table 3 Example of search terms

A stepped approach was used initially, with two facets being combined as appropriate. It was anticipated there might be a limited amount of research

within the area of sonographer employability and sonographer workforce, so a broader search exploring the ultrasound workforce and education was required. Consideration was given to further broadening the search to explore the wider health and social care context as the data collection and analysis progressed. Finds focusing on medical education and clinically focused papers were excluded as they were deemed not comparable due to this being a study of non medical health professionals. Non UK studies were included to provide a comparison with the context of the UK based healthcare system.

All search terms were looked for in the title and abstract fields. Controlled vocabulary terms were used where available. The Boolean operators AND and OR were used, alongside truncation, and phrase searching. No date limits were applied. Only papers published in the English language were sought.

The following electronic databases were used in this search: CINAHL (EBSCO), MEDLINE (EBSCO), British Education Index (EBSCO), Scopus (Elsevier). These databases were selected as their scope matched the subject of this review or because they were multidisciplinary resources. The following web resources were searched for document libraries, policy and practice documents, journal articles and any other relevant grey literature: Society and College of Radiographers (SCoR), National Institute for Clinical Excellence (NICE), King's Fund, 'Ultrasound' (the official journal of the British Medical Ultrasound Society (BMUS)) and the American Institute of Ultrasound in Medicine. Grey literature was considered essential to the research and its inclusion also helped to minimise publication bias (Booth et al., 2012).

A limited number of author, citation and reference searches were also undertaken on key resources.

The initial search strategy and terms used were peer reviewed by the University's learning centre, Information Specialist for Health and Wellbeing. The search strategy was then peer reviewed by the Faculty's Information Scientist in the Centre for Health and Social Care Research.

RefWorks, a bibliographic management tool, was used to organise the literature yielded from this review and to remove duplicates. All papers not held by the author's libraries or available online, were requested from The British Library.

All literature yielded was assessed for eligibility for inclusion in the review with defined inclusion and exclusion criteria to ensure clarity (Booth, Papioannou & Sutton, 2012). These are represented in the table below.

Inclusion criteria	**Exclusion criteria**
English language	Non English language
Non clinically focused	Clinical focus
International papers	Medical education

Table 4 Inclusion and exclusion criteria

In the first instance the eligibility for inclusion took take place at title and abstract level and all papers were single/doubled screened. This was followed by a full text reading of all remaining literature for inclusion in the review. All remaining literature which met the inclusion criteria of this review was then transferred to a matrix and further analysed for relevance. A summary of the literature search and screening process can be found in appendix 2.

Grant and Booth's (2009) SALSA was used to Search, Appraise, Synthesise and Analyse the papers which allowed a structured approach to review the literature found.

Tables were utilised to summarise the resources found and Critical Appraisal Skills Programme (CASP) tool was used initially to quality assess the qualitative finds. The practice literature was more difficult to appraise and synthesise as acknowledged by Dixon-Woods et al. (2007). Consideration was given to qualitative assessment tools and checklists and it was decided to subsequently use an assessment tool based on Hek, Langton and Bunden (2000) and Booth, Papioannou and Sutton's (2012) criteria. It was anticipated this would help assess the validity, clarity and transparency of the articles (appendix 3) by utilising two established formats.

2.3 Search Results

It was evident that very little literature relating to this topic area was available, and of those that were identified, only four pieces of research. Much of the literature was practice based and some, even professional opinion, which is considered at the lower end of Guyatt's Hierarchy of Evidence (Guyatt et al., 1995). An alternative hierarchy of evidence discussed by Wallace and Wray (2016) included theoretical literature, research literature, practice literature and policy literature, which aligned to much of the literature found. These finds were included due to the poor yield and relevant literature identified.

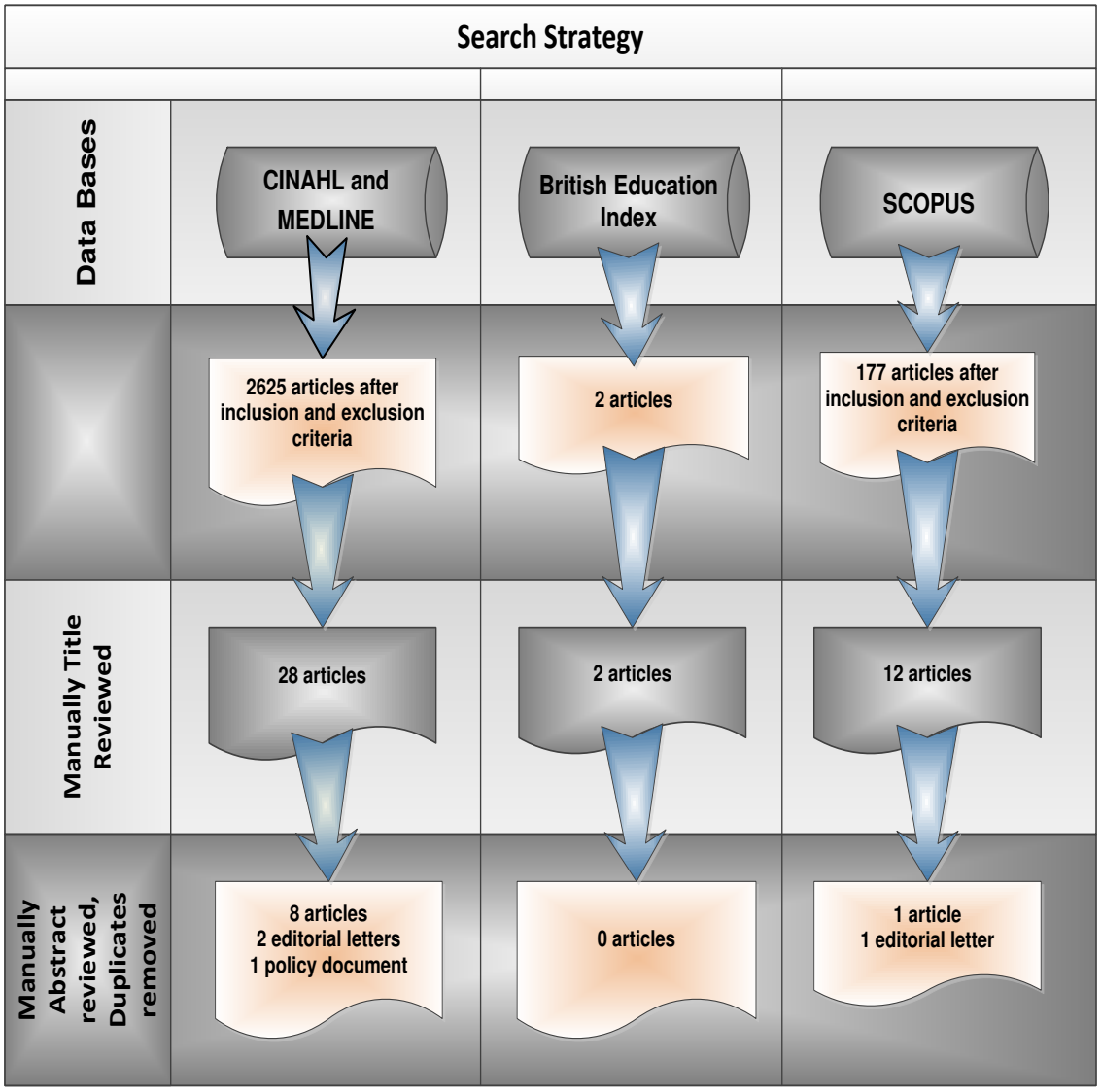

Figure 1 Database search strategy

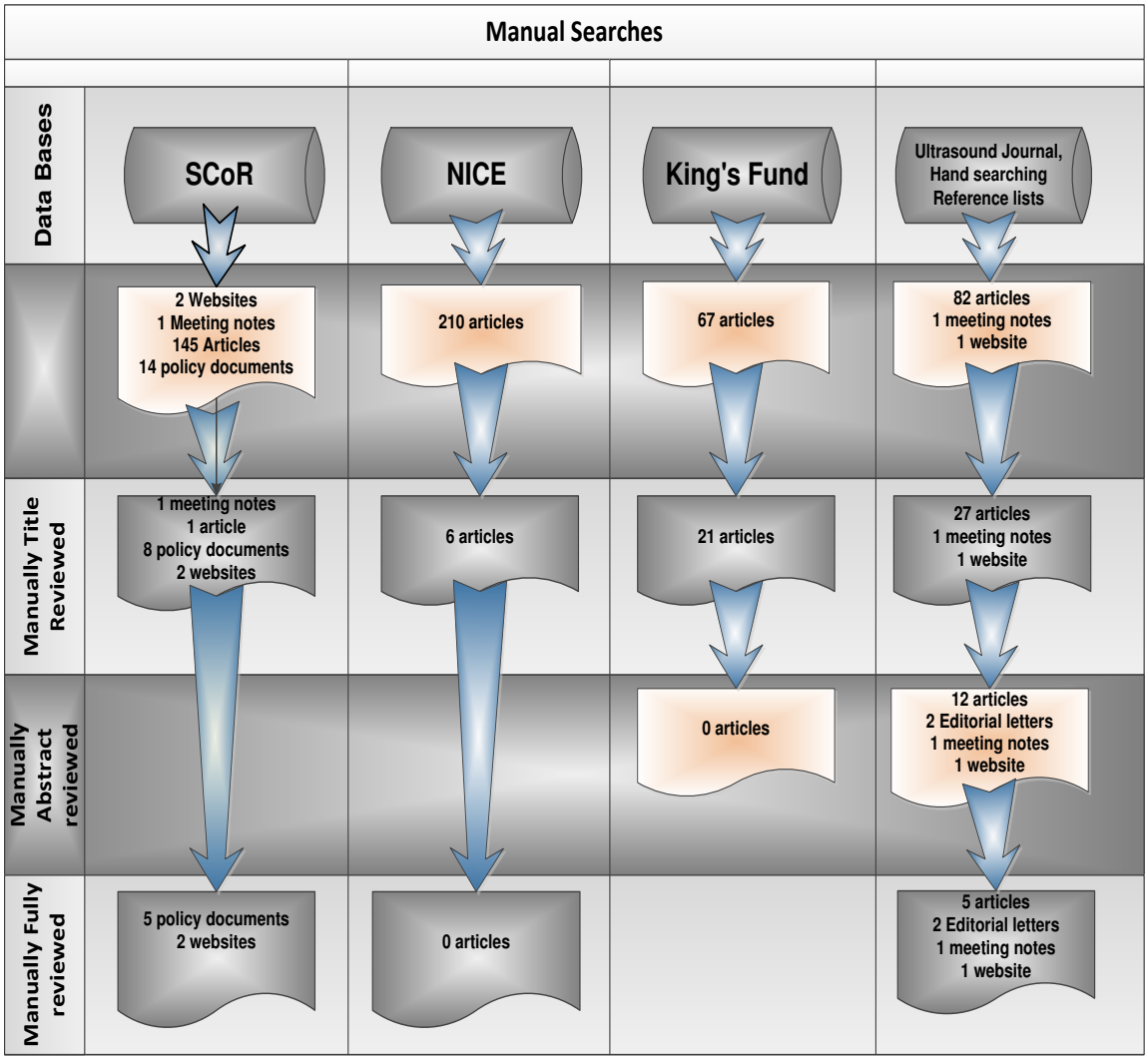

Figure 2 Manual search strategy

The search was repeated six months after the original search which yielded a small number of additional finds for inclusion (3 finds; 2 Editorial letters and 1 research paper).

RSS feeds for the duration of the research yielded no new finds as did a final search twelve months after the search.

The final results included a total of 4 pieces of research study findings published in a journal, 11 journal articles, 6 professional body guidance publications, 1 set of meeting notes, 7 editorial letters and 3 websites for initial review, represented in the table below.

Articles	Policy documents	Editorials	Meeting notes	websites
15	6	7	1	3
Total = 32				

Table 5 Final search finds

These search finds along with the researcher's previous experience (theoretical sensitivity) and preliminary work in the pilot study were utilised to develop the initial interview schedule and questions as well as to set the context for the research as suggested by Corbin and Strauss (2015). It was hoped this would also increase the validity of a study (Gray, 2014).

The literature review finds are represented in the subsequent sections under three main sub headings of education, employment and safe practice.

2.4 Education

Ultrasound is very operator dependent and appropriate training is required for safe practice (Al-Memar et al., 2015; Edwards, 2011; Sonography Canada, n.d.; Walton, 2001). The SCoR and BMUS jointly published guidance which specified that:-

> 'The minimum qualifications a sonographer would be expected to hold to practice in the UK is a postgraduate certificate in medical ultrasound that has been accredited by the Consortium for the Accreditation of Sonographic Education (CASE) or equivalent.'
>
> (SCoR & BMUS, 2016, p. 7)

In keeping with this, the majority of current ultrasound education in England is at postgraduate level. However, this creates a key problem as it facilitates the training of only small numbers of trainee sonographers, creating a disparity between the number of sonographers being trained and the number required to deliver increasing service demands (Martin, 2015; Parker & Harrison, 2015). The most recent figures available show the current national workforce deficit to be in the region of 18% (Thomson, 2014). Postgraduate ultrasound training cannot be accessed directly (Thomson, 2015b) as trainees must complete an

undergraduate educational programme in a different professional area first, for example, diagnostic radiography, midwifery or nursing. This therefore, creates a delay in training a qualified sonographer.

To address this issue, a national working group was established in 2015 by Health Education England (HEE) to review the role of the sonographer and make recommendations in relation to developing the future workforce. Several small projects were commissioned exploring different options. To date, only phase one of the project has been published providing demographics of the current workforce. Phase 2 which will make recommendations for future workforce requirements for example, has not yet been published.

This issue is not a new one (Lovegrove & Price, 2002; Price, 2010; Thomson, 2009) and perhaps reflects the challenges associated with the development and introduction of a new educational model for sonography. Parker and Harrison in their 2015 survey of BMUS members and delegates sought to explore views on the two prominent alternative models of education offering direct entry into ultrasound training without the requirement to first qualify as another health care professional.

One model is at undergraduate and the other at postgraduate educational levels. Parker and Harrison (2015) found 51% of all respondents were in favour of the introduction of a direct entry route into ultrasound at undergraduate level provided it produced sonographers with the same skills set and level of competence as current courses do. Unfortunately, a comparison cannot be made to respondents' views towards the postgraduate direct entry route as the survey report fails to present whether or not these views were sought. The benefits of both of the proposed models (undergraduate and postgraduate) identified in the survey were that it would enable sonographers to train in their first choice of profession and increase the number of sonographers trained each year. This view concurred with the findings of Parker and Wolstenhulme's study in 2012. However, this opinion was contradicted by other respondents who raised concerns over the lack of training places regardless of educational level (Parker & Harrison, 2015). Martin (2015) also recognised there was an issue with access to clinical placements due to the pressures faced by the current

sonography workforce, regardless of which training model was advocated. Primary considerations therefore must include mentor access and training lists. Parker and Harrison (2015) acknowledged that departments are limited in the number of clinical training places they can offer and therefore gave consideration to the use of simulation. Other authors have explored the use of simulation for assessing clinical competencies (Harrison, 2015) and in gaining clinical skills (Gibbs, 2014). Whilst it is recognised these studies focussed on the acquisition of psychomotor skills, Martin (2015) stressed they cannot replace the interaction and communication with the real patient. In an attempt to better prepare students for clinical placement, Halket, McKay and Shaw (2011) discussed how role playing with actors within the academic setting improved students' communication and history taking skills. Reid-Searle et al. (2014) also explored the use of role playing with the use of simulation and undertook a small scale study that assessed the effectiveness of teaching communication skills through this method. Reid-Searle et al. (2014) reported students found this method realistic, relaxed and fun, all important factors for effective learning, which afforded students the opportunity to view the scenario from the patient's perspective.

Whilst Edwards (2012) wrote in her editorial that she was hoping for the emergence of pioneering direct entry routes, the proposed development is not without its critics. Price (2010, p. 91) warned that it would be storing up 'major problems for the future' and raised concerns over musculoskeletal disorders (MSD) for sonographers. He highlighted there would not be a fall-back career for sonographers who had undertaken a direct entry programme. Martin (2015) and Parker and Harrison (2015) also highlighted work related musculoskeletal disorders in sonographers as a major concern which could lead to career ending injuries. However, it is suggested MSD can be avoided by good working practices, effective training and on going risk management strategies (Harrison & Harris, 2015).

Some authors reported challenges with the proposals due to the educational level. Walton (2000) argued it was essential the exit points should be postgraduate and not undergraduate which she claimed would be a demotion and can be aligned to the concerns over watering or 'dulling down' the role and

ultimately changes to pay and banding. Walton (2000) also went on to say sonographers fought long and hard to ensure ultrasound received recognition and to lose it by going to undergraduate education would be a shame. This raises questions as to the meaning of recognition and whether it really is aligned to Masters level education as perhaps Walton (2000) alluded to in this statement. Many pre registration educational routes offer undergraduate education to established and recognised professions. However, this then leads to discourse in sonography as currently, the educational routes in sonography do not led to a registered profession. Parker and Harrison (2015) also raised concerns that an undergraduate route would 'water down' the qualification and devalue sonographers.

Other concerns raised in Parker and Harrison's study (2015) related to the lack of life experience and immaturity of potential entrants and participants called for rigorous admissions procedures to be implemented. However, Parker and Harrison's study (2015) failed to ask the same question in relation to the postgraduate route raising concerns over the reliability of the study. It is also worth acknowledging that Parker and Harrison's study (2015) utilised questionnaires and self selecting participants. They acknowledged this as a limitation in their report as the participants completing the survey could be those with strong views and not truly representative. In addition, the sample comprised of BMUS members and delegates of the annual conference who had email addresses; whilst BMUS has a wide range of different professional groups as members, preconceptions could be introduced by sampling only members and not the wider sonographer population. Parker and Harrison (2015) acknowledged not conducting a pilot study and the inconsistencies with wording as being limitations of the study. The response rate for the study was also poor at 19.7% (n=286, from a total of 1450) raising concerns over the validity and reliability.

Some of the respondents in Parker and Harrison's study (2015) raised the requirements for preceptorship with reference in particular to pay scales and banding. Martin (2015) concurred with the view of requiring a preceptorship period following completion of the course which is also aligned to the DoH (2010) recommendations. The proposed time periods for preceptorship varied

but one article found in the initial search by Ehler et al. (2001) defined this as between six and 9 months direct supervision. It is acknowledged this article gave an international perspective and may now be dated.

Edwards (2011) raised the lack of regulation for sonographers and argued this impeded the development of a direct entry route into ultrasound training, something Lindsell had also documented back in 1999. This was reinforced by Parker and Harrison (2015) who also identified the lack of state registration as a challenge. However, the SCoR (SCoR, 2013; Thomson, 2009) maintained that this should not be seen as a barrier to the development. It was acknowledged that Edwards' (2011) paper was an editorial and comprised mainly of personal opinion and Lindsell's (1999) source was meeting notes; both of which are at the lower end of the hierarchy of evidence scales (Guyatt et al., 1995; Wallace & Wray, 2016). However, they are included due to the relevance of topic area.

Walton (2001, p. 15) reminded us of the Chief Medical Officers Statement of 1994

> 'Professional bodies relevant to the several types of healthcare professional who use diagnostic US apparatus should set standards for adequate training. Such training must encompass the Interpretation of US Images, because currently the greatest risk to an individual is from inaccurate interpretation of the image, rather than any physical hazard of the ultrasonic field'.

To avoid inaccurate interpretation, Walton (2001) called for educationalists to ensure adequate assessment of clinical competence which Gibbs (2013) stated was important in becoming accepted as a professional. All ultrasound courses approved by the Consortium for Accreditation of Sonographic Education (CASE) have clearly defined competencies which was described as the single most important factor in the quality of an ultrasound scan (Graham, Andrist & Schroedter, 2002). However, in the absence of clear benchmarking standards and regulation, concerns remain over the competency of people using ultrasound in diagnosis who have no formal training (Lovegrove & Price, 2002; Walton, 2001). Walton (2001) identified three distinct groups of people performing ultrasound and defined them as -

- those who had undertaken a formal training programme and achieved a recognised award
- those who were regarded as experts but had undertaken no formal training
- those who had no formal training and were termed 'dabblers'

The associated risks with performing ultrasound without formal training are highlighted in the safe practice section below.

2.5 Employment

As discussed in earlier chapters, the national workforce deficit for sonographers is between 10-18% (CfWI, 2012; CfWI, 2017; Thomson, 2014) with high sonographer vacancies reported as far back as 1996 (Hurleston). The situation is likely to become imminently worse (Parker & Harrison, 2015) as a large proportion of the current workforce are from a radiography background (BMUS, n.d.a; CfWI, 2017; Lovegrove & Price, 2002; Parker & Wolstenhulme, 2012) which is also suffering from workforce deficits. Compounded by a majority workforce employed at advanced practitioner equivalent level and no defined career structure (Parker & Wolstenhulme, 2012) raises the question as to what constitutes advanced practice? And is it a requirement for ultrasound?

2.5.1 Advanced practice

Advanced practice roles for radiographers are integral to the four tier structure which was first piloted by the National Health Service Breast Screening Programme (NHSBSP) in 2002 in response to the increased workload (Kelly et al., 2008). The structure was embraced by the SCoR for diagnostic radiographers to facilitate a clear career progression and pathway. However, the pathway was not as clear for their radiographer/sonographer counterparts. The four tier structure saw the emergence of the introductory level of assistant practitioner in radiography with a clearly defined scope of practice, supervised by a radiographer (Shaw, 2012) with a broad range of practice to meet the HCPC's Standards of Proficiency (SOPs) (2013). Advanced practitioners comprise the next tier, working at a high level of clinical practice and generally autonomous practitioners with consultant radiographers at the highest level to provide professional leadership, clinical expertise, educational and professional

development and research (Woodford, 2005). This was seen as a positive step by many in contrast to the view of Eraut (2005) who warned that career progression to consultant roles and even advanced roles, involved taking on an increasing amount of management responsibility and therefore limited the opportunities to further develop expertise.

The majority of definitions for advanced radiographic practice rely on generic ideals and have been criticised for their lack of clarity (Price, 2005; Snaith & Hardy, 2007). Role extension alone did not constitute advanced practice (Hart & Dixon, 2008) and was much more than just the imaging modality and included personal attributes, in particular self belief, motivation, inspiring others, commitment, autonomy, critical judgement and intellect (Hardy & Snaith, 2006; Kelly et al., 2008; Parker & Wolstenhulme, 2012; Snaith & Hardy, 2007). Hart and Dixon (2008) concurred with the view that advanced practice should also include autonomy, leadership, service development and research.
The SCoR subsequently advocated that on the whole, advanced practice involved expert practice and may involve clinical or non clinical roles related to one or more of the following -

- Team leadership;
- Education;
- Research;
- Service development.

(SCoR, n.d.a)

2.5.1.1 Accreditation for advanced practice

In recognition of the advanced and extended roles radiographers undertake, the SCoR developed a system of accreditation for which radiographers can apply (Coleman, 2013; Freeman, 2010). Applications are assessed according to the core functions of higher level practice (Department of Health, 2000) and must demonstrate 'expert' practice in one and progression into the other three, of the following categories

- Expert practice
- Professional leadership and consultancy
- Education, training and development
- Practice and service development, research and evaluation

(SCoR, n.d.b)

The SCoR also recognised that radiographers working in ultrasound require advanced practice specialist skills to fulfil national screening programme requirements, for example, Down's Syndrome screening (Fetal Anomaly Screening Programme (FASP), 2015). Worryingly, at the time of writing, there were only four sonographers nationally accredited by the scheme (L. Coleman, personal communication, 2017). Milner and Snaith (2017) found a similar scenario for radiographers as a whole, with only a very small proportion (less than 3% of their sample) accredited by the SCoR scheme. Sonographers must adhere to the screening programme requirements by maintaining and updating clinical skills and education to ensure safe practice (HCPC, 2011; Thomson, 2009 and 2014). This concurred with the HCPC standards of conduct, performance and ethics (2016) which stated

> 'You must keep your knowledge and skills up to date and relevant to your scope of practice through continuing professional development.'
>
> (HCPC, 2016 p. 7)

However, discrepancies within the existing workforce can arise as some sonographers are registered and must adhere to the HCPCs standards, whilst others are not and it is left to the individuals themselves, along with employers, to ensure standards are maintained.

2.5.1.2 Legal aspects of advanced practice

Sadly, in modern health care there are an ever increasing number of legal claims from patients and those involving radiographers can arise from a multitude of circumstances which may include missing abnormalities or causing harm (Alderson et al., 2003). Obviously this is something no radiographer, or indeed any health care professional, would wish to be involved in and contravenes the SCoR Code of Professional Conduct (Freeman, 2013) as well as the HCPC's standards of conduct, performance and ethics (2016). However, it is a key outcome identified, as advanced practitioners should

> 'Practise safely within relevant legal, ethical, professional and managerial frameworks and advise on these as appropriate.'
>
> (Coleman, 2013)

In 2014, it became a legal requirement for all registrants to have suitable professional indemnity insurance which must be declared at renewal. Whilst this is often provided by hospital employers or professional body membership, consideration must be given to those sonographers who work independently and do not have an employer in the traditional sense (Thomson & Paterson, 2014).

The scope of practice can be very wide and varied for sonographers (SCoR & BMUS, 2016) and continuing professional development (CPD) is essential to ensure practitioners continue 'to practise safely, effectively, and legally, within their changing scope of practice' (HCPC, 2011). However, due to lack of regulations with regards to who can purchase ultrasound equipment, it is not just regulated registrants that perform ultrasound examinations. In practice this means that anyone can purchase and use an ultrasound machine as aforementioned (Ashton, 2006). Very often these were used to perform social or souvenir scans for pregnant women which was not advocated (BMUS, n.d.c; Edwards, 2010; Gibbs, 2013; Leung & Pang, 2009) and can lead to disastrous consequences as seen in the safe practice section. Despite this there were increasing numbers of private companies offering such services including 3D and 4D social scanning and fetal sexing, including 'coupon' sites such as 'Groupon' https://www.groupon.co.uk/deals/hello-baby-ltd. It is acknowledged some of these scans will undoubtedly be performed by adequately trained sonographers, however, some may not.

2.5.2 Pay

Parker and Harrison (2015) warned of the difficulties in setting the pay scale for newly qualified sonographers following the introduction of a direct entry route. However, it is evident that some discrepancies already exist between professional groups and even within the same hospital Trust. One example is the disparity between radiographer sonographers, who are often on higher pay scales than their midwife sonographer colleagues, (Parker & Harrison, 2015) which can obviously result in dissatisfaction and resentment. This is a major concern, considering the importance of team working, for effective patient care (Department of Health, 1987, 1996 and 2005; Walton, 2001). Walton (2001) highlighted this was not just a local, but a national issue. Creating a defined

career pathway could address some of these issues and increase staff motivation, productivity and job satisfaction (Wilson & Colley, 2006). Jasa and Kirkland (2009) reported on such a system and described how a 'career ladder' for vascular sonographers was implemented in America to aid staff retention. The pay scales in Jasa and Kirkland's (2009) structure considered certification and experience and rewarded sonographers for having increasing levels of both.

2.5.3 Lower band sonographers

Edwards (2012) reported how there had been lengthy debates on what roles a lower band (or conversely, a higher band) sonographer could perform. She argued how a resolution required a radical change of both service design and educational models (Edwards, 2012). With constant budget cuts, managers are being encouraged to explore alternatives for service delivery and role profiling could be considered an option. Edwards (2012) acknowledged this and raised concerns about job evaluation matching versus economic constraints as well as ensuring the current band 7 sonographers continued to provide 'value for money'.

To identify if there were any tasks currently performed by the present sonography workforce, which potentially could be delegated to a lower band sonographer, one local project (Health Education East Midlands (HEEM), 2013) undertook functional mapping. They attempted to outline tasks that were considered more protocol driven technical work. However, due to lack of local support for the change in roles, this project objective did not progress.
The support of stakeholders is paramount and Parker and Harrison (2015) warned against the development of a direct entry route if graduates would not be able to gain employment on completion. One respondent in Parker and Harrison's study (2015) highlighted the lack of a clearly defined scope of practice for a graduate sonographer; one could argue this is aligned to the lack of a career structure with defined roles and scope of practice which could potentially facilitate employment. Parker and Wolstenhulme (2012) discussed the lack of a national profile for a practitioner level sonographer in their workforce review and recognised a need for a clear career structure. Perhaps there are lessons to be learnt from international experiences as Jasa and

Kirkland (2009) claimed the introduction of their career ladder for American sonographers had helped define a clear pathway for entry level sonographers.

2.6 Safe practice

The operator dependency of ultrasound for safe practice is well documented (Al-Memar, Kirk & Bourne, 2015; Goldberg, 2003). Anyone providing an ultrasound service is ethically and legally vulnerable if they have not undertaken formal training to a recognised standard (Andrist & Schroedter, 2001; Ashton, 2006). Authors reiterated the significant risks of ultrasound being performed by inappropriately trained staff (Edwards, 2010 and 2011; Parker & Harrison, 2015; Walton, 2001). Despite this, not everyone performing ultrasound or indeed using the term sonographer is adequately trained and the term 'dabblers' is often used to describe this group of people (Walton, 2001). This was sadly evident from the catastrophic effects of misdiagnosis of miscarriage by an inexperienced health professional undertaking ultrasound examination in early pregnancy in the 1990's. A scan was undertaken by an unqualified practitioner and a miscarriage was diagnosed. On the strength of this diagnosis, the patient management was planned for evacuation of the uterus in theatre. Just prior to the procedure the patient requested a second opinion and a further scan was undertaken by an appropriately trained practitioner. The pregnancy was viable and not a miscarriage. These infamous and landmark events in Cardiff prompted a public inquiry and subsequent report (Hatley, Case & Campbell, 1995) and highlighted the necessity for adequate training in ultrasound by all who use it in diagnosis. As Hately, Case and Campbell back in 1995 stated 'misdiagnosis of miscarriage should be a ‘never’ event' with Al-Memar et al., (2015) reaffirming this more recently. Subsequent protocols and guidance have been issued by the National Institute for Clinical Excellence (NICE, 2012), Royal College of Obstetricians and Gynaecologists (RCOG, 2006), SCoR and BMUS (2016) to ensure misdiagnosis of miscarriage does not occur.

2.6.1 Regulation

Parker and Harrison (2015) recognised that statutory registration for sonography was a contentious issue which had fuelled much debate. Professional bodies have been campaigning for sonographers to become

regulated (and for it to become a protected title) for many years (BMUS, n.d.a; Edwards, 2010; Lee & Paterson, 2004; Parker and Harrison, 2015; SCoR, 2009 and 2013; Thomson & Paterson, 2014). Despite this, it is not imminent and alternative methods of quality assuring a sonographer's work for patient safety must be explored (SCoR, 2013). The Governments Command Paper of 2011 made it clear they did not wish to allow entry of any new professions into statutory regulation. Instead they encouraged the development of voluntary registers (Gibbs, 2013; Thomson & Paterson, 2014) which some see as a stepping stone to regulation but also a cost cutting exercise (Edwards, 2011; Gibbs, 2013). However, there is no legal obligation to join a voluntary register and they often have limited power to deal with legal or criminal cases (Thomson & Paterson, 2014). The voluntary register for sonographers was established some years ago by the United Kingdom Association of Sonographers (UKAS) and is held by the College of Radiographers following the merger of the two bodies (Edwards, 2011; Gibbs, 2013). It does not, however, offer any guarantee of competence (Parker & Harrison, 2015; Thomson, 2015b) but is seen by some, to be a precursor for full statutory regulation (Edwards, 2011) which some employers still deemed essential for employment (Parker & Harrison, 2015; Thomson, 2014). Despite this it is perhaps surprising that in Parker and Harrison's study (2015) respondents ranked the lack of registration as being a major concern as only fifth in relation to an undergraduate direct entry and 3rd for a postgraduate direct entry course. Considering statutory registration/regulation does not guarantee competence either, it becomes less surprising. It does, however, provide a set of guidelines and standards a registrant must adhere to in order to remain registered as well as a central area for employers to check (Thomson & Paterson, 2014). This is in contrast to the voluntary register which does not have associated standards and guidelines aligned to a regulatory body.

There were discrepancies both between hospital Trusts and even within the same hospital Trust reported as to the requirements for registration of staff. Thomson and Paterson (2014) identified that, whilst some employers insisted on statutory registration, others did not and in some hospitals, they required it for certain services but not for others.

The harsh reality is that there are no legal regulations around someone using the term sonographer or performing an ultrasound scan without any form of training (Gibbs, 2013; Thomson & Paterson, 2014; Walton 2000 and 2001). Walton (2000) claimed this undermines the status of the appropriately trained sonographer and called for all to promote their profession and be mindful of their own limitations in order to protect themselves and the public. Gibbs (2013) aligned this public protection to professionalisation and stressed the importance of codes of conduct. In order to achieve professionalisation, occupational groups must hold expertise that the recipients do not have which in turn provides power and prestige (Gibbs, 2013). The strive for professionalisation is not unique to sonographers in the UK as demonstrated in Jasa and Kirkland's paper (2009) who proposed that registration with an established body (the American Registry for Diagnostic Medical Sonography (ARDMS) in this case) was a commitment statement of sonographers professionalism. Other similarities can also be drawn from international experiences.

2.7 International perspective

2.7.1 Registration

As aforementioned sonography is not a registerable profession currently within the UK, it is, however, in other countries. Edwards (2010) referred to the recognition and registration in Canada and Australia and argued this provided greater job satisfaction and reward for employees. Gibbs (2013) concurred and used the examples in Australia, Canada and the United States of America (USA) where sonography is seen as a defined registrable profession. However, one must be clear that registration and regulation, whilst often interchanged, are different. Regulation can be aligned to licensing and often associated with legal powers. Registration, on the other hand, is often voluntary albeit an expectation for practice in some countries.

The table below outlines the international perspective in relation to regulation and registration.

<table>
<tr><th>United States of America</th><th>Canada</th><th>Australia and New Zealand</th></tr>
<tr><td>There are currently only four states within the United States of America that require sonographers to be registered by law. Two of these gained licensure in 2009, the 3rd in 2015 and the 4th in 2016 (SDMS, n.d.).</td><td>Sonography Canada has no legal authority at present despite lobbying the Minister for Health (Sonography Canada, n.d.).</td><td>Sonographers are required by law to be accredited by the ASAR but it is not a registerable body and has no legal authority (ASAR, n.d.).</td></tr>
<tr><td rowspan="3">American Registry for Diagnostic Medical Sonography (ARDMS).
Responsible for accrediting and promoting continued professional education (CPD)
Tests the competency of and certifies successful sonographers who have demonstrated they have achieved a certain level of knowledge, skills and ability (ARDMS, n.d.).</td><td rowspan="3">Sonography Canada
Provides a national voice for sonographers
Has a raft of sub committees including -
A national education advisory committee
An examinations committee
An awards committee
Professional practice committee
And an official journal
Has a disciplinary board
Has codes of ethics or conduct</td><td>New Zealand - sonographers required by law to be registered but it is not a regulatory body and has no legal authority despite lobbying of the National Regulation and Accreditation Scheme (Australasian Sonographers Association, n.d.)</td></tr>
<tr><td>American Institute of Ultrasound in Medicine (AIUM)
Accredits the CPD provision
Issues guidelines on safe practice (AIUM, n.d.)</td><td rowspan="2">Australian Sonographer Accreditation Registry (ASAR)
Provides a programme of accreditation for awarding institutes
Maintains the register of accredited sonographers
Monitors registrants CPD activity
Provides a programme of CPD for members
Has codes of</td></tr>
<tr><td>Society of Diagnostic Medical Sonography (SDMS)
Network of</td></tr>
</table>

professionals who have an interest in ultrasound. • Provides education and membership of the organisation for the ultrasound community (SDMS, n.d.).		conduct and ethics.

Table 6 International perspective

2.7.2 Workforce deficit

Comparisons can be made to workforce deficits too. Naomi (2004) reported significant shortages of sonographers in the USA with the limiting factor for training being clinical placements. In her study she identified the difficulties with training students in an overstretched department with sonographer vacancies, a similar scenario to the UK, but offered no real solutions for increasing placement capacity. Five years later, Jasa and Kirkland (2009) also discussed the workforce deficit in America and claimed the supply did not meet demand for sonographers, a similar scenario to the UK. They proposed and implemented a career structure to aid retention of vascular sonographers and reduce the high staff turn over rate and agency spends.

To compound the reported sonographer shortages, radiologist shortages were also identified. Bluth (2014) predicted an imminent workforce shortage of radiologists in ultrasound in the USA which would undoubtedly affect services and can be aligned to the UK situation.

2.7.3 Recognition

Naomi (2004) advocated the promotion of the profession early in schools to increase recognition of the profession and promote sonography as a career. The lack of recognition for sonographers is frequently reported (Lovegrove & Price, 2002; Parker & Wolstenhulme, 2012). McGregor et al. (2009) defined professional recognition as formal recognition of a professional's status and achievement of regulatory body standards which raises questions relating to the UK position due to the lack of regulatory controls. They reported in their study that a major incentive for Australian sonographers to extend their practice was increased recognition. It was claimed that formalising the sonographer reporting

in Australia would achieve professional recognition which was also advocated at that time by the Australian Government (McGregor et al., 2009).

The Sonography Canada association also stated on their website that sonographers were currently not regulated and as such were not recognised as professionals. Similarities can be drawn in Australia, where sonographers are also unregulated with the Australian Sonographer Accreditation Registry supporting recognition for sonography as a profession.

2.7.4 Ergonomics

Ergonomics is a major concern in sonography all over the world. Whilst manufacturers strive to produce more ergonomically sound equipment, the issue remains of musculoskeletal disorders (MSD) in sonographers due to the body position during scanning. The arm is extended and often requires exertion of pressure simultaneously resulting in a high incidence of MSD in UK sonographers (Bates et al., 2003; HEEM, 2013; Thomson, 2014). The situation is mirrored in the USA where 80% of all sonographers are reported to scan in pain and MSD ended the careers of approximately 29% of all sonographers (Naomi, 2004).

2.8 Summary

Due to the limited number of finds from the literature review, some of the sources included either had poor response rates or were grey literature or personal opinion. However, they were considered of value to include due to the relevance of topic area. The literature was ordered into three main categories for inclusion in the literature review focussing around education, employment and safety.

It was thought reasonable to conclude that whilst the issue of a new educational model and sonographer regulation has been debated for many years, no real solutions have emerged. There were claims of potentially devaluing the sonographer role (Parker & Harrison, 2015; Walton, 2000) and increasing risks to patient safety (Ashton, 2006; SCoR, 2013). Both of these issues must be paramount when considering any reconfiguration of service or educational model.

3 Chapter three - Methodology

3.1 Introduction

The difficulties in establishing and identifying how a future workforce might look and subsequently be employed are recognised. Whilst many authors discussed the need for this, there was a lack of published literature found during the literature review offering any solutions. One paper by Hogg (2012) proposed using a qualitative scenario-based methodology which can be useful when events are uncertain. This could be considered far removed from the positivist paradigms and empirical science that have been traditionally used for radiography research. However, it is acknowledged that there is an increasing amount of qualitative research being utilised and advocated across the health professions, including radiography (Avis, 2005; Holloway & Todres, 2005; Reeves, 2008).

Qualitative research employs a wide range of methodologies and is therefore difficult to define (Silverman, 2000). It is traditionally utilised when social behaviour or actions are explored or the researcher wishes to gain an understanding of others' perceptions. Avis (2005) described qualitative research characteristics as being textually focussed, having substantive interaction with the participants, a flexible plan of enquiry and an element of naturalism, that is, familiarity with, and an understanding of, the participants. Holloway and Todres (2005) stated that qualitative methods of enquiry share broad philosophies; they are usually person centred and have an open ended start. Finlay and Ballinger (2006) concurred with this view and claimed qualitative research was like an adventure with no fixed indication where it may lead or what content will be revealed. Qualitative researchers accept the subjectivity of their role in the process in contrast to quantitative researchers who strive to remove this bias (Finlay & Ballinger, 2006).

Utilising an experiential qualitative research methodology afforded the opportunity to gain a richer, deeper understanding from the participants' perspectives on how they understand and experience the world (Braun & Clarke, 2013). A constructivist Grounded Theory methodology was utilised to generate theory.

3.2 Philosophical perspective

The philosophical assumptions of the researcher influence the choice of methodology and ultimately the research methods. It is important, therefore, that these are clear when others are reading the research.

The development of a clear research strategy has been described as the 'research onion' (Saunders, Lewis & Thornhill, 2012). This term was first coined in 1997 by Saunders, Lewis and Thornhill to represent the different layers of the research process. The outer layers represent the research philosophy and approach or methodology, the middle layer the research strategy and choice of methods and the inner layers the data collection and analysis (Saunders, et al., 2012).

In order for the development of a coherent research design consideration of the philosophical assumptions are crucial (Saunders & Tosey, 2012). Finlay & Ballinger (2006) claimed this contextualised the research and positioned it along the research continuum.

The inductive approach allows patterns to emerge that may suggest relationships rather than starting with a hypothesis that is subsequently tested (Braun & Clarke, 2013; Gray, 2014). This generation of theory from data analysis is in keeping with the constructivist viewpoint of developing theory rather than beginning with one (Cresswell, 2007). The research was set within a subjectivist epistemology, using an interpretivist lens and a constructivist Grounded Theory methodology to generate the theory.

3.3 Epistemology

Epistemology relates to how we know what we know and is concerned with the theory of knowledge (Finlay & Ballinger, 2006). It questions how and what we know and consideration must be given at the early stages of the research process as to what we are aiming to achieve, what knowledge can be gained and how we understand the role as researcher (ibid).

The two main components are objectivism and subjectivism and this research resided within the latter. Subjectivism is defined as believing meaning comes

from the subject imposing meaning on the object and that the object does not play any part in this generation of meaning (Crotty, 1998). Considering a constructivist approach, the knowledge is created by interactions (Lincoln & Guba, cited in Denzin & Lincoln, 2000) and this 'meaning making' therefore, is unique to the individual (Silverman, 2000).

3.4 Theoretical perspective

Typical theoretical perspectives within subjectivism are interpretivism and critical theory. The interpretivist notion of developing theory rather than beginning with one aligns with the Grounded Theory methodology. This is in contrast to the positivist, objectivist perspective where Grounded Theory has its traditions (Charmaz, 2015) and with which radiography research in the past has been associated, possibly as a result of its emergence from medical colleagues and the scientific nature of the work. However, increasingly, qualitative approaches are being embraced and advocated as the way forward (Reeves, 2008).

Interpretivist researchers are part of the process, positioning themselves within the research and their interpretations, therefore are mediated through their own experiences and background (Cresswell, 2007; Mills, Bonner & Francis, 2006). It was essential that the researcher's involvement in, and commonality with, the participants was declared and transparent. This was achieved by incorporating a short biography of the author in the participant information sheet to identify her own source of interest and this was also reiterated during the introduction stage of the interviews (Seidman, 2013). This thoughtful analysis of self awareness is termed reflexivity (Roulston, 2010) and it was important that this insider status was acknowledged (Braun & Clarke, 2013). Careful consideration was given to this aspect and reflected on as part of the research process and documented in the reflexivity chapter.

This is in contrast to positivist researchers who believe the world exists independent of perceptions and whose aim is to gain objective knowledge of it from an impartial 'outsider' perspective (Finlay & Ballinger, 2006).

The researcher was interested in the views and interpretations of individuals and sought to understand the thoughts, feelings and experiences of the participants; by seeing the world through their eyes (Polgar & Thomas, 2008). Participants were encouraged (via the participant information sheet and in the introductory stage of the interviews) to give their honest and true perspectives.

Livesey (n.d.) stated that interpretivism followed the notion that things hold true at that particular point in time and meaning can only be constructed in response to that particular situation, at that time.

Alongside the positivist/interpretivist debate is the realist/relativist debate. Realists are concerned with cause and effect relationships, whereas relativists advocate the different interpretations that can be applied (Finlay & Ballinger, 2006). This research followed a relativist approach believing all perceptions and interpretations to be relative to the situation.

3.5 Methodological perspective

The research used a constructivist Grounded Theory methodology.

Constructivists argue that, in the social world, there is no truth waiting to be discovered but rather it is constructed (Crotty, 1998). This construction of meaning can occur in multiple ways resulting in transformation and is not concerned with predicting or proving. From this, Geertz (1973) developed social constructivism advocating that all meaning was socially constructed without exception. Mead (in Crotty, 1998) elaborated on this and argued that we are all social constructs developed from our interactions with society and are developed through subjective interpretations of experience. Individuals have unique 'meaning making' of the world and every viewpoint is valid (Crotty, 1998) as individuals live through an event and interpret what they see and hear to make sense of it (Williamson, 2006). Aligned with the constructivist Grounded Theory beliefs, the researcher was integral, and played a part in these differing realities as co-creator (Charmaz, 2008; Ward, Hoare & Gott, 2015). In contrast, the researcher as a completely separate entity, would have been comparable to traditional Grounded Theory which is more aligned to the positivist view and advocates that the researcher is detached from, and has no influence on, the

research (Crotty, 1998; Glaser & Strauss, 1967). This was further explored in the reflexivity chapter.

Ward, Hoare and Gott (2015) discussed how constructivism could be related to learning theories as knowledge was individually constructed through experience to create versions of reality (Bryant & Charmaz, 2007; Young & Collin, 2004).

Grounded Theory is considered to be particularly useful in the study of new areas of inquiry into complex relationships and clinical situations as it aims to undercover new or poorly understood values and generates new theory from these (Ng & White, 2005; Stanley, 2006). There was very little research or guidance found relating to the new sonographer graduate and how they would be integrated into the current workforce and career structure. It was hoped this research would therefore, provide valuable insight into key stakeholder views and facilitate the development of new educational models to support a new workforce.

3.6 Grounded Theory

Grounded Theory was developed by Glaser and Strauss in 1967 utilising the intellectual traditions and differing background experiences of each of its founders to offer an alternative to the then established qualitative research methodologies. Strauss brought pragmatism, symbolic interactionism and field research experience aligned to an inductive approach with comparative analysis and abductive reasoning to generate theory. Glaser's positivist quantitative experience brought systematic systems for coding and procedural processes into the mix (Charmaz, 2015; Holloway, 2005). The coming together of these divergent backgrounds afforded Grounded Theory the benefits of both positivism and constructionism elements. However, these differences also started to manifest in opposing opinions as time progressed. Strauss' approach has been described as being somewhat 'looser' than Glaser's (Charmaz, 2015) and Strauss' collaborative work with Corbin (1990) became described as postpositivist and Glaser's as objectivist with two distinct sets of followers.

Charmaz built on these foundations and also considered the subjective role of the researcher and participants in the process and offered an alternative

approach; constructivist Grounded Theory (Charmaz, 2015). This method has been described as less prescriptive and therefore, more flexible, which is considered one of the major strengths of Grounded Theory in theory generation (Charmaz, 2015; Wertz et al., 2011). The flexibility, whilst maintaining focus, affords the researcher the ability to be able to adapt to unexpected findings. Grounded Theory also allows explanation of concerns related to a specific situation or area and therefore, offer solutions as to how these could be addressed (Hallberg, 2010). With this in mind, it was proposed future policy and guidance would inform key stakeholders proposing to employ new sonography graduates.

Charmaz (2015) advocated that the researcher cannot enter the study completely uninfluenced by their own background and experience and conceptualises the data through an interpretive lens. This prior knowledge and experience has been described by McGhee, Marland and Atkinson (2007) as the insider position, whilst acknowledging also the importance of remaining open minded. This concurred with the view of Braun and Clarke (2013) as aforementioned.

Charmaz (2015) argued that there are three major strategies employed within Grounded Theory which make it distinct from other qualitative analysis; theoretical sampling, coding and memo writing. It is however, acknowledged that other methodologies do use these in varying degrees. All three of these were employed during this study, which facilitated theory generation. Charmaz (2006) also offered advice on how the codes should be kept short, simple and analytic to allow the data to be broken down into specific, frequent and significant codes.

Charmaz (2015, p. 402) defined Grounded Theory as 'an inductive, iterative, interactive, and comparative method that provides systematic guidelines for gathering, synthesizing, analyzing, and conceptualizing qualitative data for the purpose of theory construction.'

Gerrish and Lacey (2010) concurred with the iterative and interactive nature of Grounded Theory and described the importance of the researcher going backwards and forwards through the data, making constant comparisons to

ensure the theory is inductively generated (McGhee, Marland & Atkinson, 2007). McGhee et al. (2007) described this as an inductive-deductive interplay as theory is generated (inductively) and tested (deductively) and is the essence of Grounded Theory (Saunders et al., 2012).

This notion was employed as data collection, analysis, memo writing and theoretical sampling were conducted concurrently following the notion that Grounded Theory is not a linear process but a concurrent one (McGhee et al., 2007).

It is acknowledged that Grounded Theory methodology is not without its critics. For example, Layder (cited in Thomas & James, 2006) argued that the approach highlighted the immediately apparent and that the development of theory should be more guided by data rather than being limited by it.

3.7 Ethics

Ethical considerations are applicable to all stages of research and must comply with professional codes of conduct and ethics, University and institutional ethical requirements and internationally accepted practice. Examples of these include the Declaration of Helsinki, Economic and Social Research Council (ESRC) Research Ethics Framework, by the Medical Research Council (MRC) and Research Councils UK (RCUK) (Cresswell, 2007; Greenfield, 2002; Ruxton & Colegrave, 2006; Sheffield Hallam University, 2016).

The Declaration of Helsinki, the first internationally accepted code of research ethics in medicine must not be contravened and the principles run through the whole of the research journey (Cresswell, 2007; Greenfield, 2002; Smith, 1999; World Medical Association, 2006). Principles of good research were followed at each stage. For example, at the research question stage, one must not cause harm or risk to the participants and they must be clear on the purpose of the study so as not to marginalise the participants (Cresswell, 2007). The author was mindful of the potential sensitivities relating to the introduction of a lower band sonographer practitioner and disaggregating the current band 7 sonographer role. Participants were made fully aware of the purpose of the research through the initial invitation email, participant information sheet,

consent form and introductory section of the interviews. They were also given an opportunity at the end of the interview to ask any questions and to raise any concerns they might have developed with the Dictaphone turned off. At the data collection stage, the interviews were conducted with respect and dignity and consideration given to all aspects, including psychological, physical, social wellbeing, for example. The face to face interviews allowed the researcher to adapt to any signs of stress or anxiety. Establishing a good rapport with the participants was essential so they felt comfortable and willing to disclose honest opinions (Braun & Clarke, 2013). This also increased the trustworthiness and credibility of the study.

This was ensured with consideration to the venue of the interviews and room location and set up as well as the format and conduct of the interview. At the data analysis stage, accurate recording and records were kept with accurate transcribing and member checking as appropriate to ensure accuracy and increase transferability and transparency of the study. The dissemination and writing up stage must be open, transparent, trustworthy and credible.

The research data archiving policies both locally at the University and nationally through the relevant bodies (for example, UK Data Storage) were considered to ensure safe keeping and confidentiality.

No patients were involved in the study and therefore, NHS ethics committee approval was not required. Guidance from relevant resources such as those available via the Health Research Authority's website (http://www.hra.nhs.uk) were followed. Relevant NHS Trust Research and Development/Innovation departments were contacted and liaised with to gain authorisation to contact and interview staff members therefore, ensuring compliance with governance procedures. Reference to the Health Research Authority website indicated that NHS REC approval was not required to access staff.

Although not required in the end, at the initial stages of gaining approval from the hospital Trusts Research and Development/Innovation departments, the author was asked to follow a number of processes which all added to the research journey. These included -

- application for a research passport
- completion of the non commercial templates
- service evaluation registration form
- IRAS applications
- HRA NRES assessment

Whilst extremely time consuming, these provided valuable material for reflection and aided in personal and professional development.

3.8 Risk assessment

Careful consideration was given to all aspects of participant wellbeing, including the venue. All interviews were undertaken either at the participants' place of work in a suitable environment or within the University campus. All were undertaken during normal working hours.

Consideration was also given to the content and the author was mindful that although the topic areas could be potentially sensitive, i.e. discussion of a new role and professional boundaries, they were not deemed to have the capacity to cause psychological harm. All participants were informed in the participant information sheet (appendix 4) and at the start of the interview that they could withdraw at any time and time would be allocated after the interview for the participants to raise any concerns over the topics discussed with the Dictaphone turned off.
A copy of the risk assessment form is included in appendix 5.

3.9 Pilot study

A pilot study was initially conducted to test the interview schedule and to act as a practice run for the author and to allow subsequent refinement of the interview schedule. The pilot interview participants included two colleagues, one from a sonographer background and the other from a Radiology Services manager background. The interviews were digitally recorded and transcribed by the author and the person undertaking the transcribing for the study. These were then compared for accuracy and all four transcripts along with the recordings

sent to the Director of Studies for further checking. The pilot interview schedule can be found in appendix 6.

3.10 Sampling and Participants

This study aimed to gain a deeper insight into the perceptions of key stakeholders relating to employability of a new sonographer graduate and therefore, an inductive, qualitative study utilising semi structured interviews was undertaken. Potential participants were identified using a participant profile to minimise researcher perspective and included -

- 4 Ultrasound Managers
- 5 Radiology Services Managers, plus 1 follow up interview
- 2 Consultant Sonographers
- 2 from the other relevant stakeholder group

Potential participants from the other relevant stakeholder group included Health Education England Strategic workforce planning and development manager, Health Education England Strategic workforce planning commissioner, Human Resources (HR) business partner, Professional body representative and Regulatory body representative. Participants were selected to ensure a range of different experiences, background and current working roles which enabled a representative and diverse sample. They also offered a range of perspectives relating to employability, for example, the Radiology Services Managers and Ultrasound Managers were recruiting managers of the sonography workforce, Consultant Sonographers are considered to be leading the profession and the other relevant stakeholder category offered a wide range of experience and perspectives to enhance the study (Gerrish & Lacey, 2010; Glaser & Strauss, 1967). A summary of the participant backgrounds can be found in appendix 7.

Informal and formal gatekeepers were contacted with regards to access to the participants (Seidman, 2013). Informal gatekeepers included heads of service and directorate managers and consent was gained. The NHS Research and Development/Innovation teams within the Trusts were also contacted to ensure compliance with Clinical Governance procedures and gain consent to interview staff members as appropriate. This was documented in a site file. University approval was obtained by completion of the SHUREC1 form for review

(appendix 8). This also allowed additional interviews to take place on University premises as appropriate.

In keeping with the Grounded Theory methodology, purposive sampling was utilised to identify the two initial participants; 1 Radiology Services Manager (RSM) and 1 from the other relevant stakeholder category as described above (Bluff, 2005). This allowed access to the appropriate staff identifying typical and atypical staff as originally described by Patton (1989) and numerous subsequent authors before any theory had emerged (Corbin & Strauss, 2015; Gray, 2014; Holloway, 2005; Seidman, 2013; Stake, 2006). The author was able to use theoretical sensitivity to identify these initial participants by recognising they would provide valuable insight. The decisions for the selection of each of these were documented in a reflexive diary and an example given below.

> *P1 - chosen as deemed 'in the middle'. Traditional radiographer background. Some experience of sonographer recruitment, employment and working but also has a wider view of radiology.*
>
> *Site chosen as considered proactive in engaging with local projects to address the workforce deficits. Suffering an increasing use of agency staff to maintain service. Employs non HCPC registrants.*

Once tentative theory had started to emerge from focused coding of these initial two interviews, theoretical sampling was implemented as recommended by Charmaz (2015). Theoretical sampling afforded the researcher the opportunity to identify suitable participants relevant to the subsequent data to be collected (Gerrish & Lacey, 2010; Glaser, 1978). Corbin and Strauss (2015) described theoretical sampling as being concept driven and allowed the researcher to explore specific problems relevant to that particular population. Comparisons can be drawn to the constructivist idea that there are therefore, different meanings for different individuals or groups.

Participants were selected from three main sites which included two Teaching hospitals and 1 district general hospital. This sample of sites also ensured variety in terms of one that was considered forward thinking with five year training plans, 2 that were in workforce difficulties and 1 which stipulated a

requirement for Health and Care Professions Council (HCPC) registration prior to employment with them. Additional participants recruited were Consultant Sonographers and key stakeholders from the 'other relevant stakeholder' group. This term has been selected to ensure participant anonymity.

It was acknowledged that the sample size might be perceived as relatively small which is typical of an interpretivist study (Saunders & Tosey, 2012) and of a Grounded Theory methodology (Finlay & Ballinger, 2006). It was also recognised that the number of participants required to reach saturation in qualitative research is blurred. Guest, Bunce and Johnson (2006) advocated between 6 and 12 interviews in qualitative studies should be used as a benchmark. This was assuming the sample is heterogenous and theoretical saturation has occurred (Saunders & Lewis, 2012). It was also acknowledged that there was a degree of reliance on the researcher to identify and select an unbiased sample that included typical and non typical participants, thus increasing the heterogeneity. However, authors claimed the benefits of theoretical sampling outweighed these limitations (Gray, 2014; Williamson, 2006) and researcher perspective could be guarded against through theoretical sensitivity and reflexivity. Braun and Clarke (2013) concurred with this view and recognised the associated in depth understanding which could be gained. Consideration was also given to respondents that were reluctant to participate or conversely too eager to participate as they could have had particularly strong and predisposed opinions and therefore, reduced the heterogeneity of the sample.

Once the first potential participants had been identified, initial contact was made by email to invite them to be involved in the study. The importance of informed consent is paramount and was achieved by ensuring the participant information sheet and invitation to participate in the research included the -

- research aims,
- information relating to the researcher and any declaration of their involvement in the process,
- what information was being sought and who will have access to it
- the time required of the participants
- information relating to participation being voluntary

- details about anonymity
- information relating to the storage of the recordings and transcripts

(Gray, 2014; Health Research Authority, n.d.; Seidman, 2013; Sheffield Hallam University research ethics, n.d.; Urquhart, 2013)

The participant information sheet was produced considering guidance from the University, Health Research Authority and other relevant resources to ensure it followed best practice and was fit for purpose (appendix 4).

The participants were also asked to sign a consent form (appendix 9) to ensure informed consent of the participants.

The author was also mindful of reaffirming their role during the interview at the beginning to try and eliminate any issues relating to equity or hierarchy as recommended by Seidman (2013).

3.11 Data collection

Initial semi-structured interviews were conducted, transcribed and analysed simultaneously and theoretical sampling was implemented to ensure the most appropriate participants for further interviews to provide rich data (Gerrish & Lacey, 2010). A staged approach was implemented for data collection to uphold the principle of theoretical sampling and to allow subsequent data collection to reach category saturation and strengthen emerging theory (Moore, 2010).

Careful consideration was given to identifying a suitable room for the interviews to take place in with no interruptions and consideration given to the room set up, location and refreshments, for example. This followed guidance from published work (Gillham, 2004) and advice on suitable rooms was sought from the Radiology Services Managers or appropriate Trust staff and site visits were undertaken as required. The author was mindful of allowing acceptable personal space, eye contact and orientation including posture, during the interviews as discussed by Gillham (2004).

Twelve face to face interviews, one telephone follow up interview and one telephone full interview were conducted to gain rich and detailed data. The

preferred method of face to face interviews allowed the researcher to adopt a flexible and adaptable approach to maintain some element of control over the data and observe any non verbal body language (Bluff, 2005). Due to the potentially sensitive topic of the potential introduction of a lower band sonographer, it also allowed the researcher to assess for any distress or anxiety and take appropriate action if this arose (Bluff, 2005; Gerrish & Lacey, 2010). It was felt the flexibility and adaptability of the interviews allowed the researcher to respond to situations with skill, tact and understanding (Seidman, 2013) and recognise any signs of the participant reactivity (Bluff, 2005; Paradis & Sutkin, 2017).

Any non verbal observations and additional details relating to the interview were recorded in the field notes that supplemented the recorded data and were used as a valuable source for reflection. These were dated and as detailed as possible. The follow up interview and other subsequent interview that had to be conducted by telephone were as a result of geographical position, availability and one of the participants working from home. Whilst the visual and non verbal observations were obviously lacking in the telephone interviews, the benefits were they were cheaper and less threatening for the participants (Gerrish & Lacey, 2010). During these interviews, listening for voice tone, for example, was particularly important (Gillham, 2004) as was active listening as described by Seidman (2013). It was felt that the use of this different method enhanced the research journey for the author.

The limitations of interviews being time consuming and not empowering the participants by them not having complete control of the topics for discussion, have been considered (Braun & Clarke, 2013; Gerrish & Lacey, 2010; Seidman, 2013). It was felt that the rich and detailed data to be collated from the interviews outweighed the time and lack anonymity that other data collection methods, such as questionnaires, may have offered (Braun & Clarke, 2013). It was also acknowledged that the researcher's interpretation of the data could introduce researcher perspective and therefore, distortion must be minimised by following good practice and engaging in reflexivity, as documented in the reflexivity chapter.

The interview questions (schedule) devised followed a logical and thematic order and were semi structured utilising opening development and substantive content as suggested by Gerrish and Lacey (2010) and Gillham (2004) (please see appendix 10). The introductory phase allowed the author the opportunity to explain the purpose of the study, approximate length of the interview and that it would be recorded. In addition, the purpose of the study, why it was being recorded, confidentiality and explanation of the sheet (interview schedule) used as an 'aide memoir' were reaffirmed.

Some prompts and probes were utilised to ensure the key points had been covered and to request more detail to avoid superficial answers (Charmaz, 2012). Appropriate questions followed the recommended format of 'tell me about' as described by Wertz et al. (2011). The interview was concluded with the closure stage which provided an opportunity to pull the content together, summarise and offer gratitude for their participation. Participants were also given the opportunity to ask any questions they had.

The interviews were recorded using a digital Dictaphone with each interview carefully stored under a coded folder (to anonymise them) on the Dictaphone awaiting transcription.

The constructivist approach allowed exploration of the individuals' interpretations and 'meaning making' of the world built from their own experiences. Each individual viewpoint or perception is valid as there is no one truth in constructivism (Crotty 1998). Following the interpretivist position, the questions changed as new insights were found and provisional categories emerged (Booth, Papaicannou & Sutton, 2012). This allowed emerging theory within a Grounded Theory approach to be tested in subsequent interviews. For example, sonographer experience emerged as an early tentative category and so the interview questions were amended to explore this.

Interviews were conducted until saturation was reached and included a total of thirteen interviews and one follow up interview.

3.11.1 Transcription

Each interview was transcribed including all verbal utterances to ensure an in depth understanding of, and familiarisation with, the material (recordings). Care

was taken to ensure correct punctuation, sentence structure and wording to avoid misinterpretations (Braun & Clarke, 2013). Pauses were also included in the transcripts as these can provide valuable insight into the way the participants were thinking hard about their answers before replying. These were read and re read to ensure familiarisation with the material.

Someone was employed to transcribe the interviews and to ensure the quality of these both the transcriber and author transcribed the two pilot interviews. These were then checked for accuracy by the author and Director of Studies as aforementioned. The remainder of the interviews were transcribed with the author checking each one in detail to ensure accuracy and familiarisation with the material (Braun & Clarke, 2013). The use of transcribers is integral to many qualitative research studies and the process must be clearly documented to enhance trustworthiness (Davidson, 2009).

Participants were offered the opportunity to receive a copy of the transcribed interview for member checking as a credibility check to avoid misinterpretations (Braun & Clarke, 2013; Roulston, 2010). The use of member checking of the transcripts has been included on the participant information sheet.

The digital recording of the interviews not only allowed analysis of the data but allowed reflection on the whole process. Listening to the recordings allowed the author to try and identify the three stages of listening Seidman (2013) described. The first stage was to concentrate on what was being said to ensure understanding, the 2nd stage involved listening for specific words which indicated the difference between the outer/public voice and the inner voice. The third stage related to the operational issues such as time, not interrupting or reinforcing responses with the use of 'O.K.' or 'yes'. This allowed the author to develop as a researcher and interviewer as the study progressed.

3.12 Data Management

Confidentiality was maintained by ensuring no participant names, Trust names or any data which could identify the participant was excluded. The interview recordings were filed under coded folders and the Dictaphone kept in a secured drawer to ensure anonymity. The recordings will be kept for approximately three

years following successful completion in MPEG-1 Audio Layer 3 (.mp3) format in an attempt to future proof them as per recommendations for the UK Data Service. After this period the audio files will be deleted in line with the University's Research Data Management Policy (n.d.) and the Research Councils UK (n.d.) to ensure anonymity.

All transcripts had identifiable information removed and were kept on a password protected computer in MS word format as recommended by the UK Data Service (n.d.). These will be kept for three years following successful completion of the research in the University's central research data archive storage (SHURDA) following advice from the Head of Library Research Support and the Data Management support team. The University's Research Data Management Policy (n.d.), Research Councils UK (n.d.) and Health Research Authority guidance was considered. Storage in the SHURDA will allow a public record of its existence but there will be no external access other than, for instance, by bona-fide parties under a non-disclosure agreement for the purposes of verifying the research outputs. This increases the integrity of the research according to the University's data management policy.

The University's Research Data Archive stated it was not intended for consent forms and ethical approvals and instead recommended paper documentation was stored in the Facilities Directorate central archive. Therefore, relevant documentation will be stored in the secured central archive for three years after the completion of the research.

3.13 Data Analysis

A complete open coding method was used initially to identify anything and everything of interest from the transcripts. They were coded with a word or brief phrase that captured the essence of interest and all relevant codes assigned to each point of interest (Braun & Clarke, 2013; Charmaz, 2015; Gerrish & Lacey, 2010; Urquhart, 2013). This allowed the author to see the data in a different light and reduced the possibility of imposing any preconceived ideas on the meaning (Charmaz, 2012). Constant comparison was made from the interviews, field notes and literature as suggested by McGhee et al. (2007), Giles et al.

(2013) and Corbin and Strauss (2015). This was followed by a more directed and selective focused coding of the most frequently occurring or significant codes to develop the tentative categories which were considered to be more abstract and a higher level of coding (Charmaz, 2012; Stanley, 2006). It was acknowledged that there is some reliance on the researcher to make choices of the most relevant categories, therefore, an initial code set and memo writing were sent to the Director of Studies for review. From these codes, categories and patterns emerged with core categories being interpreted which have explanatory power and a central phenomenon which theory was built from. The author was mindful that the emergence of categories must be from the data and not forced upon it by preconceived ideas (McGhee et al., 2007).

NVivo, version 10 was utilised to identify, code and analyse the data. Further analysis took place by hand and with the use of diagrams latterly to act as a visual aid. The production of multiple diagrams allowed testing and questioning and building on each other, providing a clear record of the journey to that point (Urquhart, 2013). Strauss (1987) called these diagrams 'integrative diagrams' which give direction to the research. Category dimension mapping was also undertaken to demonstrate the overlap between subcategories as suggested by Dey (2007) and Stanley (2006) to further facilitate category development. Charmaz (2006) advocated these mapping diagrams maintain the empirical complexities whilst allowing flexibility for theorising relationships.

As aforementioned, the inductive approach allowed patterns to emerge that may suggest relationships. One could argue that this is far removed from the positivist paradigms traditionally underpinning the scientific objective background of diagnostic radiography which aims to remove all bias and contamination by the researcher. In comparison, the researcher plays an integral role in the research from an interpretivism perspective and it can be argued this is an advantage as the researcher's standpoint and professional knowledge shapes the research. However, the researcher must remain mindful to ensure researcher perspective is eliminated as far as possible from the research which has been aligned to the Grounded Theory's postpositivist roots (Kennedy & Lingard, 2006). This stance has been challenged by authors such

as Mills, Bonner and Francis, (2006) who instead advocated a mutual relationship between the researcher and the participants.

The experiential data collection method allowed the author to focus on the participants' standpoint and how they experienced and made sense of the world (Braun & Clarke, 2013). One could argue this links to triangulation as the researcher attempted to look at the data from a third person's perspective to ensure it was not over or under simplified. However, triangulation may not be appropriate for this particular research as there is only one method of data collection and one researcher. Therefore, member checking was offered as a 'credibility check' (Braun & Clarke, 2013; Roulston, 2010).

3.14 Emerging theory testing

The initial coding yielded six initial nodes with 11 sub nodes in NVivo. Memo writing was an integral process to the analysis and informed the theoretical sampling. Notes were also kept of decisions made as well as constant questioning of actions. The second level of nodes consisted of 3 nodes and 9 sub nodes and the 3rd level, 3 nodes (categories) and 8 sub nodes (sub categories). The fourth level consisted of 3 categories and 9 sub categories.

The inductive approach of Grounded Theory was followed to allow tentative theory to emerge which was then tested using theoretical sampling (McGhee et al., 2007). As theory emerged, the categories were refined as further data collection and analysis took place as well as going back to the earlier transcripts and nodes (categories) for checking and exploring theoretical concepts relating to the emerging theory.

During the early stages of analysis, the work of Downie (cited in Hogg, Hogg & Bentley, 2007) was utilised and the subcategories which emerged were structured around four of the 5 aspects Downie considers important to be a professional -

- A well defined skills base underpinned by knowledge
- Being educated rather than trained
- Having a code of practice
- Being autonomous, accountable and freedom to act

These key aspects remained relevant and have been used as a basis for discussion where relevant in the emerging theory.

Theory testing continued until saturation was reached after a total of thirteen interviews and one follow up interview and no new data emerged. However, it is acknowledged that saturation does not wholly equate to no new data emerging but also to the development and relationship between categories with clearly defined dimensions (Corbin & Strauss, 2015). The final cross referencing was undertaken by hand to ensure the final categories and sub categories were complete.

3.15 Memo writing

Theoretical memos were first suggested by Glaser in 1978 and have increased in use throughout qualitative research studies (Urquhart, 2013). During coding and analysis in Grounded Theory, memos should be written concurrently to allow ideas and theory building to occur (ibid) as well as providing an audit trail (De Chesnay, 2015). Memo writing has been described as the intermediate stage between data coding and theoretical analysis (Charmaz, 2015). By using memos throughout the study, ideas, thoughts and challenges were captured as recommended by Charmaz, (2015), Corbin and Strauss (2015), Hallberg, (2010) and Strauss and Corbin, (1998) and these where then used extensively in the writing up stage. Memo writing forced questioning and increased the 'rigour' and credibility of the research and emergent theory as a result (Corbin & Strauss, 2015; Lempert, 2007). The process also allowed any gaps to be identified which can then be explored in later data collection (Charmaz, 2015).

The early coding and memos consisted of an overarching theme which became the memo title and subsequently high level concepts as suggested by Corbin and Strauss (2015). Within this were also lower level concepts which, following constant comparisons became tentative categories (McGhee et al., 2007). The memos varied in length and were initially shorter, becoming longer and more in depth as the research progressed and tentative categories emerged which is typically expected (Corbin and Strauss, 2015). The memos were stored on a

password protected computer to maintain confidentiality. The memos were separate to field notes which were shorter and focussed more on initial observations and conceptualising the observations. An example of memo writing is included in appendix 11.

3.16 Trustworthiness, credibility and dependability

The rigour, validity and reliability of qualitative research has fuelled much debate as these terms have been considered by many to be more in keeping with traditional scientific quantitative research (Murphy & Yielder, 2010). As a result some authors have offered alternative terms to describe the rigour or quality of qualitative studies (Lincoln & Guba, 1985; Murphy & Yielder, 2010; Seidman, 2013; Tobin & Begley, 2004) whilst others completely rejected the term 'rigour' in relation to interpretive enquiry (Tobin & Begley, 2004).

The trustworthiness of the research was ensured by clearly mapping each step and decision to ensure transparency. Booth et al. (2012) described the transparency of the literature searching as being auditable and the findings grounded in the data and not from a prior conclusion. This transparency also increased the transferability of the research to other potential settings by allowing the reader to assess the potential for applying the findings in other contexts (Braun & Clarke, 2013). Transparency is a key point along with sensitivity, rigour, commitment, coherence, impact and importance in Yardley's 'flexible' quality principles (2008). Lincoln and Guba (1985) described trustworthiness as having four key components, credibility, dependability, transferability and confirmability.

The credibility of research has been defined by Beck (1993) as how 'faithful' the description of the research was. Chiovitti and Piran (2003) advocated the following to ensure credibility of Grounded Theory studies. Firstly, to allow participants to guide the inquiry. This was achieved by using semi-structured interviews and also using theoretical sampling. It was acknowledged that by using unstructured interviews this could have been increased further but would have reduced the researcher's level of control of topic areas to explore in theory testing, for example. Secondly, to check theory construction against the

participants meanings; all participants were offered a copy of the transcript and a second meeting. It was also acknowledged that member checking does have its critics who warn against participants who may wish to change or deny their words (Braun & Clarke, 2013; Tobin & Begley, 2004; Tuckett, 2005). Thirdly, to use the actual words of the participants; the interviews were transcribed word for word and any comments used in the write up, were word for word. The use of the participants own language increased the credibility of the research (Strauss & Corbin, 1990). Chiovitti and Piran (2003) also advocated the researcher should be transparent about their views and insight which can be achieved through reflexivity, field notes and theoretical sensitivity. Hall and Callery (2001) also recommended the use of reflexivity to enhance transparency and general trustworthiness which is further explored in the reflexivity chapter.

The dependability was increased by a clear audit trail of all decisions made and was achieved through field notes, reflective accounts and memo writing. This was also a consideration at the literature reviewing stage to clearly document what was and was not done (Booth et al., 2012).

Authors described dependability as another researcher being able to follow the process and understand the decisions made (Beck, 1993; Braun & Clarke, 2013; Carpenter, 1995; Guba & Lincoln 1981). Chiovitti & Piran (2003) termed this auditability and advocated specifically documenting details of how and why participants were selected. Strauss and Corbin (1990) also identified the importance of the sampling decisions which were documented by the author.

As aforementioned, transferability is increased with transparency. However, caution is needed in interpretative studies as it is individual's perceptions and viewpoints which differ which add to the rich data collated and therefore, need to be conceptualised for generalisability (Murphy & Yielder, 2010).

In contrast to quantitative studies within the positivist perspective where researchers strive to eliminate all bias, qualitative studies must acknowledge that this is not completely possible due to the individuality and role of the researcher within the research. The importance is to be able to recognise this insider status and remain non judgemental to ensure confirmability. The

researcher must be aware of or account for perspective and any subjectivity (Murphy & Yielder, 2010) and therefore, the importance of a clear audit trail is paramount to demonstrate interpretations come from the data (Tobin & Begley, 2004). The author was mindful of this throughout the study.

4 Chapter four - Findings and Discussion

4.1 Introduction

This chapter presents the findings of the study and associated theory. In order to contextualise and integrate the findings and interpretations supported by literature, it was decided to present the findings and discussion as one chapter. Three categories and 9 subcategories were generated through interpretation of the accounts as the following figure demonstrates.

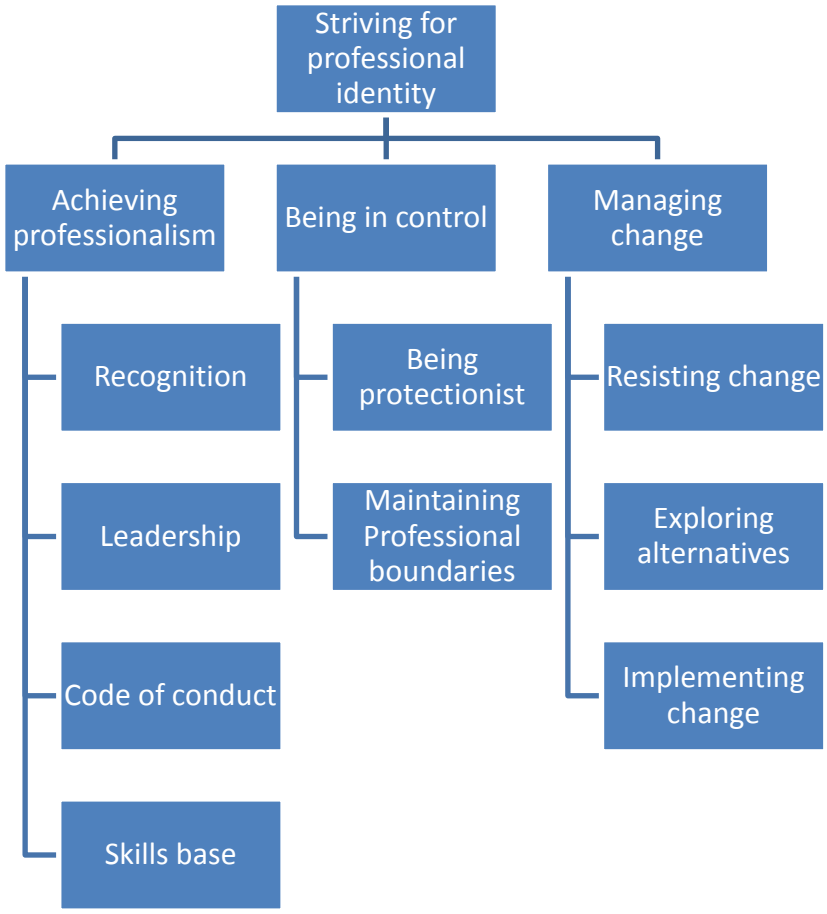

Figure 3

An overarching core category (theory) emerged, *striving for professional identity,* which was the central phenomenon and interlinked to all other categories and sub-categories (Holloway & Todres, 2005). 'Striving for professional identity' represents the basic social processes perceived to be involved in the participants' accounts and illuminates a struggle for the development of sonography as a profession in its own right, with direct entry

preparation for practice as a sonographer. This ‘striving’ was interpreted as being related to ‘achieving professionalism’ in sonography to become a separate and distinct occupational group, rather than being an advanced skill practised by a myriad of professions. The achievement of professionalism was seen to be obstructed by various barriers including; lack of ‘recognition’, lack of ‘leadership’, lack of role clarity regarding the ‘skills base’ involved and the lack of registration or regulation in terms of sonography having a specific ‘code of conduct’ to adhere to. The lack of registration or regulation was linked to the ‘being in control’ category in which participants related regulation to protecting the public and employer. ‘Being in control’ extended to a distinct trait of gatekeeping by a range of occupational groups including sonographers, radiologists and managers. This involved ‘being protectionist’ about the status quo and ‘maintaining professional boundaries’ in an endeavor to exert power and dominance. 'Striving for professional identity’ also involved ‘managing change’. In this category ‘resisting change’ appeared to be deeply rooted in sonography culture and there was a perception that any change should be from a national drive, rather than from sonographers at local levels. ‘Alternatives’ to sonography training and how changes could be ‘implemented’ were explored by participants through reflecting how knowledge could be gained from other occupational groups, such as midwifery, who had pursued self regulation and registration in isolation from the nursing profession.

Table 7 below demonstrates the content in each category.

Striving for Professional Identity		
Categories		
Achieving professionalism	**Being in control**	**Managing change**
Sub categories		
Recognition • Being professional • Having professional standards • Raising the profile • Lack of professional identity • Lack of respect • Group membership • Being special	**Being protectionist** • Medical dominance • Protecting the public • Protecting the Employer	**Resisting change** • Lack of solutions • Apathy to change • Lack of clarity on the lower band sonographer role • Need for national drive
Leadership • Holding power • Challenging the process • Inspiring a shared vision • Enabling others to act • Modelling the way • Encouraging the heart	**Maintaining professional boundaries** • Sonographers as gatekeepers • Radiologists as gatekeepers • Employers as gatekeepers	**Exploring alternatives** • New career pathways • Exploring experiences of other professions
Code of conduct • Having a professional code • Values and behaviour • Barriers to employability		**Implementing change** • Change management
Skills base • Underpinning knowledge • Research • Lack of a career structure • Dulling down • Lack of clarity • Being trained versus being educated • Advanced practice		

4.2 Striving for Professional Identity

Participants struggled with the concept of professional identity and a high proportion of them believed sonographers lacked it. They gave a multitude of reasons for this and examples included the lack of recognition for the role.

P8 erm I think quite often the identity as viewed by the public erm I think they don't see the identity of the sonographer - quite often you get mistaken for a nurse or another health care professional

P10 the individual professional identity for sonographers is maybe slightly less obvious than the radiographer professional identity but then the radiographer professional identity is not as clear as nursing or doctors or medics really

P11 also referenced the lack of career structure in relation to professional identity

P11 I think the biggest thing is erm this thing about err not calling us nurses and you know trying to raise the erm the our erm perception of the working colleagues and things like that erm that I think, I think that's the thing I believe that the career structure is about having our own career structure and having our own identity as a profession cos I think that is because I don't think we have a professional identity actually at the moment do we really as sonographers?

This lack of recognition and career structure were further explored under the subsequent categories (4.3.1. and 4.3.4.).

This perception of sonographers not having a professional identity was raised by other participants.

P6 we haven't really got a professional identity, is what I feel

P5 o my goodness, professional identity, (pause) I suppose mine's quite wide really err (pause) I don't think well a bit back to before really I don't think erm (pause) the old individual groups is going to last very much longer in that we all have erm I'm a sonographer but I inject and I have diagnostic and injection clinics so my identity is a bit woolly and we have nurses who do ultrasound

P5 so I think erm (pause) I don't feel it's particularly important to have a specific identity is that what you mean, a specific job titles or?

The pauses and hesitation perhaps indicated the participant was unsure about what professional identity meant to them, in action, first described by Schon (Schon, 1995). The resultant explanation from the participant related to a job

title and role and responsibilities rather than what it means to have a professional identity (Haslam, 2004; HCPC, 2011 and 2014; Stets & Burke, 2000). Their response can be aligned to having a clearly defined skills base and associated scope of practice which is identified as important (Parker & Harrison, 2015) but blurred for sonographers. This is further explored in the skills base section (4.3.4.).

Considering Schon's (1995) theory of in action and on action learning and utilising a constructivist approach, it is possible the participants were attempting to make sense of their past experiences to create new learning and subsequently, inform the responses. Comer (2016) suggested this occurred when there was a surprise from something unexpected in routine activity which prompted questioning of knowledge. This moment to moment thinking, also described as on the 'spot thinking', can facilitate reassessment of, and alterations to, behaviours (Comer, 2016; Johnston & Fells, 2017). Thompson and Pascal (2012) agreed with this view of thinking on your feet and argued that professionals often drew on their existing knowledge base without realising it during action to create new learning. It is important to acknowledge that this professional 'artistry' (Edwards, 2014; Stockhausen, 2006; Thompson & Pascal, 2012) is different to what has been described as the objective technical response (Comer, 2016; Schon, 1983; Thompson & Pascal, 2012). Instead it was claimed this was a higher level, more flexible and complex approach to professional practice where practitioners interpreted, co-constructed and humanised their actions to each situation (Comer, 2016; Thompson & Pascal, 2012). This was thought to be of particular use in problem solving of complex situations (Maughan, 1996); thus it can be applied to the difficulties participants experienced in offering explanations or definitions for professional identity or indeed new training models. Thompson and Pascal (2012) reinforced this view and suggested that in action learning aided us to make sense of our identity.

Authors claimed that professional identity and personal identity (or self concept), were interlinked with the latter being a pre-requisite of the former (Carlsen, Hermansen & Vrale and Hermansen, cited in Öhlen & Segesten, 1998; Johnson, Cowin, Wilson & Young, 2012; Ohlen & Segesten, 1998).

Murphy (2009) related this to radiographers as having both 'front stage' and 'back stage' identities. The former referred to the public facing self and the latter to the inner personal self which is evident when they are out of the public eye. These public facing and personal identities have also been described in micro and macro levels. The macro level related to the public face and identity of the profession and public perception, whereas the micro level was more individualised and incorporated qualifications and knowledge associated with the profession (Wackerhausen, 2009). This therefore, has the potential for discourse in occupational groups where there is poor or confusing recognition of the role, as in sonography and was evident in the participants' comments above. The struggle to define one's role prompts questions akin to 'who am I?' in any particular situation (Hong-wen, Piliavin & Callero, 1988). Each individual holds different role identities, which can have varying levels of importance dependent on the situation and are validated by behaviour and interaction (Mead, 1934 cited in Crotty, 1998; Thoits, 2012). The level of importance, or salience, of each role an individual holds can be aligned to identity and social identity theories.

Hong-wen, Piliavin & Callero (1988) argued that individuals holding multiple roles benefitted from better physical health and reduced psychological distress. In contrast, Thoits (2012) suggested the converse that multiple roles were likely to produce role conflict and lead to ill health and distress. The holding of multiple role identities created challenges for the author relating to role conflict. Some participants saw them in the role of University lecturer rather than researcher which is evident in the following extract and explored more fully in the reflexivity chapter.

P10 so midwife sonographers then are they, do you get many of them training

The building blocks for professional identity are laid down early in life and are influenced by previous life experiences (Lordly & Machellan, 2012). Johnson et al. (2012) concurred with this view and advocated that professional identity started to develop prior to any training or education. Participants alluded to this with comments related to assessing interview candidates for posts.

P13 so that you feel that they've got the right characteristics to come in and to learn

P13 for me when I do recruitment, I find that you gauge a lot about that person probably in the first five minutes just by talking to them and you get an idea of how they behave…… the actual personality I think is quite important to try and assess as best you can nothing's perfect If you think you know that person can be empathetic, do they seem to be caring, have quite an open personality or not and I think traits like that are very important to come into an environment such as a hospital

Several authors believed this constantly changed throughout a professional's career as confidence and competence increased and there was further role extension (Baldwin, 2012; King & Ross, 2004; Nystrom, 2009). P9 related this to banding and development

P9 there's no point, you know, it's a development you know, they can at band 6 they're doing this - let's measure this measure that da di da at band 7 there's more to it

P9 they're a band 5, and then they're a band 6, then they become a band 7 erm because I found that jump was too much

Further development of the professional identity took place through education, as the identity of a professional was learnt from others in the same group or occupation (Johnson et al., 2012; Ohlen & Segesten, 1998; Strudwick, Mackay & Hicks, 2012). Hashimoto et al. (2014) found in their study that this learnt professional identity was more effective when observing others who were performing the same role rather than by other forms of education. This 'peripheral participation' in activities associated with the role during training and education facilitated the progression from student to professional (Lave & Wenger, 1991). The development of professional identity is undoubtedly important for students progressing and feeling part of the professional team (Crossley, 2009).

In addition to learning from others within the same professional group, interprofessional learning is also of significant importance which builds the foundations for interprofessional and multi-disciplinary working. By the inclusion of interprofessional education into the pre registration courses such as nursing and radiography any negative attitudes and inaccurate perceptions were

reduced (DoH, 2001 and 2007). It was thought that the use of the 'contact hypothesis' reduced any prejudices in different groups by learning collaboratively (Burford, 2012). In this way many of the preconceived stereotypes and perspectives associated with 'in group' membership of different professional groups were minimised by interprofessional learning (Burford, 2012). The use of multi disciplinary seminars and team working facilitated increased awareness of professional identities and improved cohesion and therefore, a better understanding and respect for each others roles (Begley, 2009; Burford, 2012; King & Ross, 2004; Reeves et al., cited in Burford, 2012). Typically, interprofessional education includes health and social care professional groups and in cases where the medical education is separate and not integrated there are missed opportunities. In this scenario the ability of interprofessional learning to minimise negative attitudes and preconceived stereotypes (whilst facilitating the gaining of respect) are reduced between doctors and other health and care professionals. Therefore, conflict may still arise as a result of medical dominance and historical aspects where similarities and overlap in professional identities or boundaries occur (Machin, Machin & Pearson, 2012).

Whilst there was much literature published on professional identity related to other health professions (including medicine and nursing) there was very little related to radiography and even less to sonography (Niemi & Paasivaaria, 2007). However, it was possible to draw similarities from the literature in other health professions related to the development of 'self' and identities through interactions with others. In particular, it has been argued that both social identity and identity theories are essential to achieve a fully integrated view of the 'self' despite being separate entities (Stets & Burke, 2000). In contrast, Hogg, Terry and White (1995) argued that there were substantial similarities and overlap between the two. The defining qualities were demarcated as identity theory having a tendency to focus on the role of each individual within a unique, but integrated, group activity whilst seeing things from their own perspective; whereas social identity theory focused on the group with individuals identifying with each other, seeing themselves as similar with similar views (Hogg et al., 1995; Stets & Burke, 2000).

4.2.1 Social Identity Theory

The origins of Social Identity theory (SIT) lie in the early work of Tajfel in the 1950's and were later built upon by Turner in the 1970's (Hogg et al., 1995; Willetts & Clarke, 2014).

The key premise of SIT was described as group belongingness and intergroup behaviours which included self categorisation (Willetts & Clarke, 2014). Membership of the group defined how you should act and behave (Hogg et al., 1995) and individuals were labelled as 'in group' members who held the same views and attributes and were seen as parallel members (Stets & Burke, 2000). These group based identities were categorised as cognitive (social identity), attitudinal (self categorisation) and behavioural (group performance) (Stets & Burke, 2000; Willetts & Clarke, 2014) and are worthy of a more detailed exploration.

4.2.1.1 Social identities

Stets and Burke (2000) defined social identity as a person's knowledge that they belonged to a group or social category along with other individuals holding similar attributes. These similarities allowed the individual to be labelled as 'in group'. In contrast individuals who demonstrated differences were labelled as 'out group'.

Participants spoke about holding similar attributes in relation to experience for example or a certain skills set and therefore, were categorised as being 'in group' or 'out group'.

P5 so yes I would employ a nurse with, or physio or, or a radiographer, or an OT or anybody with the right skills and experience with rheumatology to do rheumatology ultrasound but I wouldn't employ a new graduate, no

This created a positive perspective towards those holding experience in rheumatology as they were seen as 'in group' (Burford, 2012). This was because they were perceived to hold the 'right skills' in rheumatology, and the 'out group' as someone without any rheumatology experience.

The skills and experience in rheumatology as a social identity were given higher relevance or salience than ultrasound skills. However, it is worth acknowledging that salience is reliant on context and different roles or social identities are

adopted depending on which seem the most relevant to that particular social setting (Haslam, 2004; Mead, 1934 cited in Crotty, 1998; Thoits, 2012). For example, one identity may be more important in one particular situation or group, as demonstrated in P5's comment above, but not so much in another situation or group (Stryker & Serpe, cited in Willetts & Clarke, 2014). P9 spoke about having ultrasound skills as important and this formed the basis for sonographers to develop later into specialist roles.

P9 it's a case of them understanding but then having the reassurance I think, of knowing that people can develop, you know, we can still move on and perhaps by doing this there might even be better opportunities for the future

P9 in our department, by having specialist sonographers erm and developing them into 8a roles it's given them that little bit of structure so they can see they're coming in as a trainee and they can see a career progression in front of them

These different identities can be ranked in order of importance, or salience and difficulties can occur when 'many hats' are worn in different situations, sometimes leading to confusion and blurring of the role in that particular situation. As aforementioned, the author experienced evidence of this during this research journey and this was reflected on in the reflexive journal.

Willetts and Clarke (2014) identified two additional aspects to social identity theory; nested identities and cross cutting identities. Nested identities are associated with formal social categories as can be found in organisational structures and related to job roles (Hogg & Terry, 2001). These identities are categorised into higher order identities related to the wider context, for example being a member of a professional body group, and lower order identities related to a group of staff for example. Nested identities were reported to have dimensions such as inclusive/exclusive, abstract/concrete and proximal/distal (Hogg & Terry 2001). Identity salience remained stable in nested identities (Willetts & Clarke, 2014).

Cross cutting identities were classified as formal, (for example, a member of a committee) or as informal such as in a member of a friendship group. Hogg and Terry (2000) described cross cutting identities as lower order identities which

were therefore, concrete, exclusive and proximal. They advocated that salience depended on the subjective importance and situational relevance (ibid).

4.2.1.2 Self Categorisation

Turner and Hogg first described self categorisation in the 1980's as expanding individuals' understanding of the self and the collective (Turner, Oakes, Haslam & McGarty, cited in Willetts & Clarke, 2014) and was related to the individual's perception of the similarities of the group members and self (Stets & Burke, 2000). Hogg et al. (1995) believed categorisation sharpened group boundaries and (it can be assumed therefore), reaffirms professional boundaries. Where boundaries are unclear, confusion can ensue. P5 spoke about 'old groups' and how working outside the traditional setting created a lack of clarity.

P5 literally down to erm not knowing what kind of mandatory training you should be having cos, are you a radiographer? Are you a nurse? Or do you work in rheumatology? It's literally down to that and it's not helpful and whilst it's good to talk the talk, it's very difficult to work outside your (pause) old area really

P5 I don't think erm (pause) the old individual groups is going to last very much longer in that we all have erm I'm a sonographer but I inject and I have diagnostic and injection clinics so my identity is a bit woolly

Individuals were thought to have many categories of self categorisation at different levels of abstraction, with the higher category level being more inclusive abstraction (in group) and the lower the level of category, the more exclusive the abstraction (out group) (Haslam, 2004).

Haslam (2004) described the three levels of self categorisation as superordinate or human level, intermediate or social level and subordinate or personal level with authors advocating that each person has a unique combination of social categories to which they belong (Stets & Burke, 2000). The formation of in group and out group categories has been well documented as a group phenomenon (Burford, 2012; Hogg et al., 1995; Stets & Burke, 2000; Turner et al., cited in Hogg, Terry & White, 1995) of which depersonalisation was a basic process leading to the transition from an individual to a group member (Hogg et al., 1995).

4.2.1.3 Group performance

Some participants spoke about the need for change and that this would need to be a national directive.

P1 but I think that's where er as a national, you know, the the erm College and Society of Radiographers need to erm embrace that and erm you know, and put that forward really

However, there appeared to be no apparent motivation for sonographers themselves to work as a group to achieve any change which is explored in the *modelling the way* section (4.3.2.4). This could be a reflection of the autonomous and independent working associated with sonography as they are often scanning their own lists in a room alone. This was highlighted by P6's comments

P6 I certainly wouldn't want them working in isolation

P6 so they could be working with their own lists…… knowing that there'd be somebody next door who could help them out if they found an unexpected finding

However, team working is paramount for quality patient experience and was recognised

P6 so they'd have to be part of a team and I'd want, I'd want them to be,

P6 ideally in, in a setting like ours where you've got three or four rooms going you'd just have one of the, er your baby ones, your newly qualified ones in a team

Quality patient care is well documented as paramount in the literature and can only be achieved through effective team working (Department of Health, 1987, 1996 and 2005; Walton, 2001).

Team working and associated group performance in relation to organisations is well documented and was sub-divided into motivation, group performance goals and norms and efficacy by Willetts and Clarke (2014). There is a perceived reluctance of sonographers to work for group goals to develop new educational models and instead individual gains were prioritised in an attempt to maintain control of their existing roles.

P1 erm I think certain people don't like change erm they're trying to protect their own role

P7 yes I think I think, it's not going to happen unless attitudes change

P4 well, I mean there's always some resistance to change and people are very wedded to their, their as you say their professional identity

Haslam (2004) argued that motivation to work on behalf of the group rather than for individual gains is intertwined with identity (Haslam, 2004) and the perceived lack of professional identity could therefore be a barrier to group working.

Historically, different motives have been described including self esteem (Abrams, cited in Stets & Burke, 2000), collective esteem (Crocker & Luhtanen, 1990), self efficacy (Abrams & Hogg, 1990) and self regulation (Abram, cited in Stets & Burke, 2000). More recent studies have shown multiple motives are used by a person to appropriately represent a particular role or group (Stets & Burke, 2000).

It was thought that social identity salience mediated between identity and performance and Haslam (2004) advocated that a similar mediating role was played by group performance goals and norms and efficacy. Individuals behaved to enhance the in group evaluation through accepted group standards to achieve group goals (Willetts & Clarke, 2014) and therefore, enhanced their own self evaluation (Turner et al, cited in Hogg, Terry & White, 1995). This has been described as maintenance and enhancement of the self esteem (Stets & Burke, 2000). Whereas, efficacy related to the individual's perception of being able to control performance and in situations where efficacy was restricted, professions can be oppressed. Comparisons can be made to the historic development of the radiography profession (and nursing) where there has always been some exertion of control over these professions from medical colleagues to maintain professional boundaries by increasing self categorisation (Witz, 1992). The separate occupational groups, (such as radiologists as one group and radiographers as another, for example), reinforces the individual's perception of the similarities (and differences) of the group members and self (Stets & Burke, 2000). This is explored in the *being in control* section (4.4.). There has been no specific research found related to social identity theory and

sonography and its association with professional identity. In addition, there was very little related to radiography and the published work related to nursing remains obscure and lacks clarity (Willets & Clarke, 2014). There is a need for further work, especially in relation to sonography, to provide a clear classification for the occupational group, secure professional identity and professionalism and cement the position within the modern health care setting.

4.2.2 Identity Theory

Similarities between SIT and Identity Theory (IT) have been previously alluded to with self categorisation found in both. Mead (cited in Crotty 1998) followed the interpretative notion that the self was a product of social interaction as people get to know who they are through interactions with others. In IT this comes from imposed labels or names from society as a result of individuals' roles and expectations of each others behaviours (McCall & Simmons, 1978; Stryker, 1980). Stets and Burke (2000) advocated that a person's own identity was composed of self views which were formed as a result of reflexive activity. Individuals viewed themselves in terms of meanings attributed to them by a structured society (McCall & Simmons, 1978; Stets & Burke, 2000; Stryker, 1980; Turner et al, cited in Hogg, Terry & White, 1995). For example, P10 described her role as manager as meaning she was in charge.

P10 my current role is medical imaging manager at X erm and that means that I'm in charge of the imaging services

In relation to specialist sonographers, P10 referred to job descriptions and the meaning attributed to the specialist title.

P10 we're making them absolutely be specialists in single areas and leading with MDTs and a core group of consultant radiologists to prove that the sonographer can be that specialist

The specialist posts motivated sonographers to develop these roles and the greater the commitment to an identity or role, the greater the salience; increased effort was made to fulfil the role (Stets & Burke, 2000). Role identities were also described as hierarchical which Stets and Burke (2000) claimed accounted for the different reactions of individuals in the same role, to the same situation; they have different identity saliences. Identity salience was increased

if occupying the role was important in a social relationship and if the number of people in the social set was higher (ibid). In the above example from P10

P10 to prove that the sonographer can be that specialist

This inferred that sonographers had to prove their abilities to medical colleagues as a result of the historical development of the profession. This placed greater emphasis and importance on the role in the social relationship and therefore, increased salience.

Participants referred to behaviour and described being conscientious as a requirement for professionalism. Using critical reflection described by Thompson & Thompson (2008) to look beyond what was being said at face value, P9 was discussing moral judgement and action and therefore, moral identity as described by Blasi (1980).

P9 I still get people coming in and saying o alright you can't win em all can you? and they're the people who I, to me aren't in the same league but that's an attitude as well, that's an approach to being a professional you know, for me it's maintaining those skills, you know, trying to develop on them, always putting my patients first erm always trying to strive for something a little bit better

Blasi (1980) believed that identity was the centre of one's being and the characteristics associated with each individual varied and were considered as the 'real me' (Stets & Carter, 2011). However, Blasi's theory has been criticised as moral identity does not always lead to moral behaviour and can be dependant on the context or situation (Hardy & Carlo, cited in Stets & Carter, 2011). Hardy and Carlo (cited in Stets & Carter, 2011) also suggested that not all moral behaviour was deliberate (as Blasi suggested) but that some may be automatic and sub-conscious.

4.2.3 Moral and ethical behaviour

Moral behaviour related to professional practice can evoke feelings of guilt if there is a disparity between what people do and what they feel is their responsibility to do (Stets & Carter, 2011). There appeared to be a dichotomy in sonography as some participants called for change but did not see it as their responsibility to lead the change, whilst others were resistant to change and were happy to do nothing.

P6 We can't keep waiting 5 years to deliver a sonographer, who might have done a radiography degree that they're now not using

P7 I just think there is a resistance to looking at it

This can also be related to advanced (and consultant) radiographic practice where radiographers are aware of the requirement and importance for developing expert practice and engaging with research but a disappointing number actually achieve this (Milner & Snaith, 2017; Snaith, Harris & Harris, 2016). Both are imperative to increase the underpinning knowledge base (as defined by the DoH core categories (2000)) and therefore, attain the recommended minimum qualifications.

Participants recognised this need but also the challenges faced in realising it

P4 it's hard to release people to do the training or take on extra lists of their own because we need to keep the core staff

P4 there's also lots of other erm advanced practice and other developments that staff can go into that we're very happy to support, but then that again pulls on the core the core rota

P6 I mean ideally you'd want some sort of structure to your workforce so, if you're bringing in people at the bottom you want to release people to do more things at the top

P10 sonographers or scientists, I believe should be allowed to increase and progress the profession through the appropriate clinical liaisons they have and develop

Moral behaviour is entwined with identity and ethics which are integral in both our personal and professional roles. Gillon (1994) identified four principles for explaining ethical issues in health care which are respect for autonomy, beneficence, non-maleficence and justice. Gillon (1994) claimed that using these can help in the decision making process in difficult ethical situations which frequently arise in sonography. For example, informed consent is aligned to respect for autonomy as the patient has active involvement in choices related to their treatment and management. This can also be applied to research where informed consent must be obtained from participants. Beneficence related to putting patients first, whereas non-maleficence places a duty of care to avoid harm; both imply the health professional is acting in the best interests of the

patient. Some participants explicitly commented about doing their best for the patients

P9 always putting my patients first erm always trying to strive for something a little bit better

P11 ensuring that you do the best of your ability to provide patient optimum care and quality

P13 that's what I came in to do to look after patient that's what I'm here for, so whatever is needed

Both beneficence and non-maleficence are described by Flite and Harman (2013) as key aspects of ethical leadership and professional practice. By far the most commonly documented evidence related to ethics is in obstetric scanning where the unique scenario requires consideration of two patients. This often requires balancing the interests of both mother and unborn child which can create ethical dilemmas (Edvardsson, Small, Lalos, Persson, & Mogren 2015; Howe, 2014).

Whilst behaviour is undoubtedly a key aspect of professionalism, the HCPC (2011) argued that professional identity had a greater role to play. Professional identity is reinforced by performance and undertaking actions of a professional who historically, have been perceived as people with high social status and value (HCPC 2011). Achieving this status and subsequent professionalisation, was recognised to be more difficult for 'newer' professions than for those who were more established (HCPC 2011). It has been suggested that this 'status' is related to professional judgement and critical thinking; both core aspects of advanced practice (DoH, 2000) which when fully integrated into clinical practice can increase the status of the radiography profession through multi disciplinary working (Milner & Snaith, 2017; Nightingale & Hogg, 2003).

4.3 Achieving professionalism

One participant gave quite a detailed description of the meaning of professionalism

P11 professionalism erm I believe is to do with err working within your scope of practice, maintaining your, continuing professional development erm, ensuring

that you do the best of your ability to provide patient optimum care and quality at all times and I do believe that includes appearance, and erm your attitude, and erm work ethic, literally everything how you speak to colleagues, how you're perceived in the department, erm everything really

This interpretation included many of the key aspects of professionalism as identified by Downie (cited in Hogg, Hogg & Bentley, 2007) and as previously discussed in the methodology chapter, was utilised to try and add clarity to the memo writing.

All other participants struggled to define professionalism and indeed professional identity. This could perhaps be as a reflection of there being very little research conducted historically into the term 'professionalism' in relation to the professional groups currently regulated by the HCPC (2014b). There is even less published work related to occupational groups who are not regulated, such as sonography.

It was also mirrored in the reported lack of recognition for certain professionals such as radiographers and sonographers from both health professionals and the public. This recognition is essential to reinforce professional identity (HCPC, 2014b).

4.3.1 Recognition

The HCPC (2014b) suggested that it may take years for the public to recognise a role as a profession and that changing roles such as those from a radiographer to a sonographer for example, may be poorly understood by service users, carers and other professionals. Many participants highlighted this as an issue for sonographers but also for radiographers.

P6 most, the public don't know what a sonographer is they don't know what a radiographer is erm they might know what a health care professional is

P13 I suppose in fairness I don't know how aware people are of radiographers in that respect because they often call us nurses or some people think of us as technicians

P13 it's still considered from an outside view doctors and nurses

P10 we're all nurses or doctors depending on what you're wearing in the department

McGregor, O'Loughlin, Cox, Clarke and Snowden (2009) defined professional recognition as individuals having formal acknowledgement of the status of a profession and highlighted in their study that the lack of it was a disincentive. In an earlier study, Ohlen and Segesten (1998) argued that professionalism and professional identity provided stability and power.

Gibbs (2013) concurred with this view that the status of the profession, or power and prestige, must come from holding expertise and was a key requirement for professionalisation. Undertaking expert clinical practice, one of the four core domains for advanced and consultant practice outlined by DoH (2000), was claimed to be poorly understood and recognised by some managers (Harris & Paterson, 2016). This could ultimately lead to challenges for consultant practitioners to fulfil all domains associated with their role including leadership and service improvement as discussed above.

This professional status was also related to by some participants in the form of 'professional standing'. One participant spoke about this in terms of the lack of appreciation of the importance of the ultrasound department within the hospital and another participant in relation to the sonographers.

P4 erm so it's quite hard maybe going into a profession and there's not a standard cos it could undermine your professional standing I suppose

And when asked for clarification on the meaning of professional standing responded it was associated with having a clear professional identity and what it means to be a radiographer or sonographer for example. It is reasonable to assume therefore, that professional identity, (being professional), related to the perception of that particular profession by the profession itself and the public and can be aligned to role identity theory.

Several articles alluded to the lack of recognition of the sonographers' role (Lovegrove & Price, 2002; Parker & Wolstenhulme, 2012) and therefore, one could surmise that perhaps sonographers have a weak 'front stage' and a low macro level identity.

P10 the individual professional identity for sonographers is maybe slightly less obvious than the radiographer professional identity but then the radiographer professional identity is not as clear as nursing or doctors or medics really

P9 but I still think we've got a lot to offer and I think it would give us a bit more standing

Professional standards and regulatory controls were also reported to be important for professionalisation in the interests of public protection (Gibbs, 2013; Giddens, 2010) which creates discourse for sonography, as currently there are no professional standards or professional or regulatory controls. Participants discussed this in terms of sonographers needing their own professional regulation and professional identity (P11) and how the lack of professional codes had led to a lack of professional identity (P7). This was explored more fully in the *code of conduct* section (4.3.3).

This position is not unique to the United Kingdom (UK) and comparisons can be drawn from the international arena where professional bodies encouraged sonographers to demonstrate their professionalism by registering with them (American Registry for Diagnostic Medical Sonography, n.d.; Jasa & Kirkland, 2009).

In an attempt to improve this lack of recognition, Naomi (2004) advocated the promotion of the profession in schools and three participants identified increasing the public's awareness of the profession as a potential solution.

P6 it's maybe about, maybe it's more about getting into schools maybe it's about, and we do do some of that we deliver even to primary schools what X-rays are and who takes them so it's probably that sort of thing that needs to happen more

P6 we need to raise the profile I suppose it's more, is it about more, you know having more of a voice having more open days when they do

P11 cos I don't think that, it's not pushed as a profession is it

P13 so we have world radiography day we do try to promote ourselves but I still hear, 'one of the nurses'

The importance of raising the external profile of radiographers to improve recognition has been aligned to advanced practitioners contributing to multi disciplinary team (MDT) meetings for example (Milner & Snaith, 2017). However, this valuable contribution might not be achievable for all advanced practitioners, or indeed, consultant practitioners, due to organisational

structures creating barriers due to the lack of understanding of the roles (Henwood, Booth & Miller, 2016). Despite this, the Chief Allied Health Professions Officer's team (2017) stated consultant radiographers were integral to the MDT meetings and it was critical they were involved to optimise quality patient care.

Some participants also spoke about colleagues having a lack of understanding of the role of a sonographer too.

P6 er certainly from the public and even within the specialities: for example I've had obstetricians call me a stonographer, we get called ultrasonographer or and I feel even people in the trust don't know the difference between a radiographer and a radiologist

P10 (pause) I don't think they're as well recognised as radiographers and not by colleagues, I think colleagues in the trust would absolutely know who the sonographers were, but by the general public sonographers are, and radiographers are no different from nurses or you know, all allied health professions come under one banner don't they?

P11 I think the biggest thing is erm this thing about err not calling us nurses and you know trying to raise the erm the our erm perception of the working colleagues and things like that erm that I think, I think that's the thing I believe that the career structure is about having our own career structure and having our own identity as a profession cos I think that is because I don't think we have a professional identity actually at the moment do we really as sonographers?

P4 and P6 went on to suggest the poor professional identity was related to the lack of recognition from the public and other health care professionals not really knowing what a sonographer was as highlighted earlier.

The difficulties faced by participants in defining professional identity related to the lack of recognition which was also associated with a lack of respect for the profession and group of individuals.

P11 I just think yea there's a bit of the respect's gone

Some participants made reference to professional colleagues, such as radiologists for example, and discussed how they believed respect was being eroded between professionals.

P11 and it's all calling em by their first names and you know, going out for a pint with them and like I say in some ways that's good that we've brought professional boundaries down like that isn't it? But somewhere on the way we've lost, we've lost something as well

Being part of a team was perceived as important and group membership (as well as having shared values, behaviours and goals) is a key premise of Social Identity Theory as discussed earlier. It can also be important in maintaining professional boundaries and is further discussed in that section (4.4.2.).

4.3.2 Leadership

French and Raven's work of 1959 related to social power and explored leaders' abilities to influence attitudes, values or behaviours and how this influence increased with the level of 'power' they held (Northouse, 2015). Northouse (2015) identified this as positional power. Kotter (1990) argued that key to leadership is strong influencing power which effective leaders use on a continuous basis. Participants discussed how sonographers are 'special' due to the high level of skills (or expert practice) and the workforce deficits.

P4 F/U it's quite nice to be special and needed, sort of psychological point of view. You could think well I'm going to be less special and needed if there's more people able to do what I do

P5 concurred with this view and stated

P5 they've made us too special, all of us

P5 cos in our experience our areas, it is even more specialised

Being special also related to their own area of clinical expertise; participants appeared to act favourably towards their own area of clinical interest or expertise which is explored in the *being in control* category (4.4.).

Some participants stated sonographers have a louder voice which allowed them to make demands for higher pay for example.

P4 because people are in a shortage profession they often have a louder voice

P3 well sonographers would like more! The experienced ones want an 8a

In contrast, others thought sonographers were poorly represented at national forums and groups and therefore, had little influence or voice.

P11 and I think having one representative on the, in the Society (pause) that you know, represents the whole of the sonographers in the country you know, is that right? erm and same with the HCPC.

This lack of representation or national voice presents difficulties for sonographers in relation to holding power and having influence. The feeling of being special does not equate to 'real' power in terms of leadership and positional power but rather into perceived power during the current workforce shortage. The perception of holding power is therefore transient.

Clear leadership is however essential in order for the profession to drive changes forward in conjunction with ownership for developing and implementing change. Considering Kouzes and Posner's transformational leadership model (1993), five core behaviours associated with influential leaders must be evident; challenging the process, inspiring a shared vision, enabling others to act, modelling the way and encouraging the heart.

4.3.2.1 Challenging the process

Challenging the process of sonography training and the associated development of new educational models and career structures has been discussed over many years. Sadly, there has been no real drive or leadership to implement change but this has recently gathered momentum. Opportunities have been identified for new training models and these involved risk taking and experimenting with solutions. Participants referred to pilots already underway for example

P9 I never sent anyone to 3 plus 1 because I just wouldn't, you know, I would never, I mean we have accommodated two trainees from there to come and spend a week with us

P11 I've done the 3+1 pilot and I don't believe they're advanced practitioners when they come out

The Five Year Forward plan (2014) reiterated the notion of identifying opportunities, taking risks and experimenting with solutions and vowed to support local leadership to achieve this.

Challenging the boundaries and process is not new for sonographers. Sonographers historically led the way in challenging professional boundaries for

radiographers and identifying opportunities. This is evidenced in ultrasound with the performance of scans and subsequent addition of reporting on scans delegated from medically trained radiologists to non medical trained radiographers (Hart & Dixon, 2008). The introduction of the Diploma in Medical Ultrasound by the Society and College of Radiographers (SCoR) in 1977 expedited and reinforced this opportunity for sonographers. However, sonographer role development has plateaued in comparison to radiography colleagues and indeed other allied health professionals (AHPs) in terms of research activity (Probst et al., 2015; Snaith, Harris & Harris, 2016) and leadership (Harris & Paterson, 2016). Both of these are important aspects to advanced practice raising questions around role fulfilment at band 7 (Edwards, 2012; Milner & Snaith, 2017) and being proactive in leading sonography to true professionalisation. There is further exploration of what constitutes advanced practice and reporting in the *skills base* section (4.3.4.).

4.3.2.2 Inspiring a shared vision

The second core behaviour, inspiring a shared vision, is reliant on a group of people having clear team objectives (Borrill et al., 2000) which can also involve clarifying each professional's roles and responsibilities (West & Markiewicz, 2004). There is always the shared vision of the patient in health care which was highlighted by participants

P9 always putting my patients first erm always trying to strive for something a little bit better than what it is really and then actually helping other people to strive to be like that as well erm that's to me is what a professional is,

P11 ensuring that you do the best of your ability to provide patient optimum care and quality

This shared vision was identified as a key component to transformational leadership (Kouzes & Posner, 1993; Northouse, 2015) and soft influence is required for enquiry and persuasion in order to bring people together to achieve shared goals (Kotter, 1990). Any changes in education and training in sonography requires people to transform in relation to emotions, values, ethics, standards and long term goals, aligned to transformational leadership theory (Downton, cited in Northouse, 2015). Participants spoke about getting the most

influential sonographers in the department to promote any proposed changes to create a shared vision.

Transformational leadership theory has gained much popularity and there are a large number of publications relating to radiography and wider health care, which used the term transformation in relation to leadership. One example, from the professional body, the College of Radiographers, is their publication titled 'A Framework for Professional Leadership in Clinical Imaging and Radiotherapy & Oncology Services'. This framework reaffirmed 'the objective was to lead people through transformational change to develop and deliver better local services' (Freeman, 2005, p. 8). There are examples of where this has been achieved such as radiographer skill mix and advanced and consultant radiographer reporting (Chief Allied Health Professions Officer, 2017). Participants gave examples of where specialist sonographers had been introduced to develop specific areas of ultrasound practice.

P10 so, you know it's as well as doing the exams it's the audit, the research and, the professional work that goes with being a specialist, you know we're looking for someone who wants to do that

Inspiring others to share the same vision and embrace change relating to new training models in sonography is essential but remains under debate. This creates tensions as at the time of writing there was no nationally agreed way forward for ultrasound training or to meet the ever growing workforce deficits.

4.3.2.3 Enabling others to act

Enabling others to act, was the third core behaviour and must be achieved through collaboration and mutual trust. Participants spoke about gaining trust between sonographers and radiologists for example

P9 it's that that trust I think is unique in radiology

This is intertwined with inspiring a shared vision and can only be achieved if sonographers embrace ownership and lead the way for change. Participants recognised the need for the current sonographer workforce to take ownership of any changes in order to push the agenda forward (P6, P4). Comparisons can be drawn from the radiography profession, as a high proportion of the sonographer workforce were from a radiographic background. Lovegrove and

Goh (2009) reassured that radiographers are well placed to take on leadership roles (as well as become followers) due to their historical context. Despite this, Harris and Paterson (2016) called for radiographers to be more proactive in embracing leadership roles to avoid being left behind by other AHP colleagues. Some participants outlined how the introduction of specialist sonographers with a specific clinical remit were expected to take on such leadership roles.

P9 in our department, by having specialist sonographers erm and developing them into 8a roles it's given them that little bit of structure

P10 we're making them absolutely be specialists in single areas and leading with MDTs and a core group of consultant radiologists to prove that the sonographer can be that specialist

The importance of multi-disciplinary collaboration (as in MDT meetings, for example) is paramount for quality patient care (Department of Health, 1987, 1996 and 2005; Walton, 2001). More recently the Governments Five Year Forward plan (2014) called for national leadership to work collaboratively to enable a radical improvement in patient experiences. The importance of inter professional or multi disciplinary working has been debated within the health and social care setting for many decades (Xyrichis & Lowton, 2008). Today, it is well recognised as essential with numerous policy documents advocating the benefits (Department of Health, 1987, 1996 and 2005).

This collaborative working was initiated by the Leadership Framework (United Kingdom Secretary of State for Health, 2011) which was the first single agreed understanding of leadership and consistent approach to leadership development regardless of professional background. This spanned all clinical professions as well as the educational and regulatory sectors. Integral to the framework was the Clinical Leadership Competency Framework (CLCF), which traversed the career of every clinician, including radiographers from the start of their training.

4.3.2.4 Modelling the way

The fourth core behaviour, modelling the way, involved providing a role model, removing obstacles and offering guidance. Barriers to employability of a sonographer graduate were identified by participants related to the lack of clarity on roles a lower band sonographer would perform, non registration, pay,

career structure and acceptance by the existing workforce. This concurred with evidence reported by many authors (Edwards, 2012; Parker & Harrison, 2015; Parker & Wolstenhulme, 2012).

Some participants advocated there should be a national drive for change in sonography education and training rather than individual pockets of change. P1 believed this should be through the professional body; the College of Radiographers.

P1 it's something that would be some sort of national, through the College of Radiographers as well because I think sometimes people go off doing other things and it it becomes quite difficult you know

P1 but I think that's where er as a national, you know, the the erm College and Society of Radiographers need to erm embrace that and erm you know, and put that forward really

P2 and P4 concurred with this view that there was a need for professional and regulatory bodies to work together to push this agenda forward and lead the way.

P2 erm (pause) I think all whether its employers, professional bodies or regulatory, should all work together to try and sort of resolve erm again to remove any barriers to employment

P4 I'm sure you could do it in another way if there was an agreed format but that again would take all the people locally or nationally agreeing so you may as well, I don't see why you don't do it through HCPC

Participants believed this national drive would overcome a lot of operational issues and a nationally agreed structure could then be implemented.

This view was reflected in P7's statement that the situation could only be resolved by a national drive

P7 *I think that it'll only be resolved if if, so so if they brought in someone like HEE*

P7 I don't think the sonographers can break it themselves I think it's too, it's gone on too long, it's too entrenched and people erm quite rightly I fully appreciate everyone's views on it erm but I think it needs to come from outside and say this is what we're going to do

Many participants' responses alluded to the notion that it was someone else's responsibility to lead sonography forward which could be perceived as Laissez-faire leadership or the 'non-leadership factor' as described by many authors (Bass & Riggio, 2006; Hendry, 2013; Northouse, 2015). In this style there is an absence of leadership and responsibility is abdicated, decisions delayed and there is little effort to meet the needs of the ‘followers’. The lack of leadership is reported to be detrimental on team effectiveness and decision making (Borrill et al., 2000; Field & West, 1995; Rutherford & McArthur, 2004). In addition, to the lack of leadership being detrimental to team effectiveness, it has also been suggested that status within the team sometimes prevented members from participating in the decision making processes (Molyneux, 2001; Rutherford & McArthur, 2004). This could be as a result of the perceived 'power' and status of the leader which affected the behaviour of the 'followers'. Northouse (2015) classified this as 'legitimate position power' which was related to an employee's job title, roles and responsibilities. Participants spoke about the situation in sonography (and radiography) and claimed these positions, such as heads of department or clinical leads, are often held by radiologists.

P11 I still think the radiologists are trying to keep, keep control and most of the HoCS in department are still radiologists

This created challenges due to the historical development and dominance of radiographers by radiologists.

Despite leadership being identified as one of the core values of the job title of advanced practitioner, (Coleman, 2013; DoH, 2000; Freeman, 2010; Tootell & Hogg, 2010; Yielder, 2006) only half of the respondents in Milner and Snaith's study (2017) perceived leadership to be integral to their role. Respondents appeared to confuse leadership with management. This is explored more fully under the *managing change* section (Rost, cited in Yielder, 2006; Tootell & Hogg, 2010).

4.3.2.5 Encouraging the heart

P7 if the sonographers are against the students at the start it’s just not going to work, so I think it’s really a hearts and minds…… so it’s hearts and minds have got to change

In the above statement P7 alluded to the importance of encouraging the heart which was the final key behaviour identified by Kouzes and Posner (1993).

Other participants stressed the importance of gaining the support of the existing workforce and changing the culture.

P6 I think the other issue is cultural it's about acceptance of the current workforce to erm embrace this change and erm work with, work with us to make sure it's successful

P6 we'd have a little bit of work to do with the current workforce to erm make sure we got their support, so that's the major cultural thing - it's more or less we've always done it this way so erm this new way won't work.

This can also be aligned to being resistant to change and being protectionist but also highlights a need for strong leadership to motivate and inspire others to achieve shared goals and implement new systems of work.

4.3.3 Code of Conduct

Participants made reference to the association between professional identity and having a code of practice or conduct. P7 stated sonographers have no professional identity which was partially attributable to the lack of a professional code.

P7 I think one of the problems that we have as sonographers is we have no professional identity we call ourselves sonographers and but we're not recognised as a profession and it is, it's one of the things that have caused the problems, or has been associated with the problem in that it hasn't even got its own professional code

P7 erm professional identity would mean to hold a, a body of knowledge and erm experience that is er not held by others and you would be considered expert in that er particular field and that you are also bound by a set of codes as to how you conduct your work,

Gibbs (2013) and Giddens (2010) identified having a code of conduct to adhere to as a key component for professionalisation along with having a trade union and members. Applying these requirements to sonography it became evident that the definition was 'fluid'. Sonographers are not regulated by their own professional or regulatory body. There is instead heavy reliance upon sonographers maintaining registration in their first professional area in addition to the voluntary register held by the Society and College of Radiographers.

Professional regulation can be seen as an essential element for a workforce to be recognised as professionals and is often determined by its legal status, i.e. whether it is regulated. This created ambiguity as sonographers are registrants in another profession other than sonography which is reflected in participant comments.

P11 I haven't done an X-ray for 25 years so why am I registered as a radiographer, I couldn't go and work for somebody as a radiographer

This participant went on to say sonographers need their own professional regulation and professional identity.

Some participants related professionalism and professional identity to having guidelines and standards to follow.

P8 I think to be a professional erm you need to have erm achieved certain standards in your chosen role and follow set guidelines erm which meet the criteria of whichever professional body that you're related or affiliated to

P8 I think with any health care course or any health care profession there are set, certain standards and conduct and I would presume they would need to follow that

P2 they would have to be clear as to their standards and their erm expectations and so their code of conduct really

P4 a bit like patients expect that erm (pause) erm we're going to be operating to the correct standards they would expect that someone described as a radiographer and we're, we're happy that they're operating to the right standards

Many participants also related being professional or having a professional identity to values and behaviour (as outlined in published codes of conduct and performance such as the HCPC (2016) and this can be related to the earlier discussion around Social Identity Theory and group membership (Hogg, Terry & White, 1995).

P13 to me that's it's your behaviour your values that all contribute to it

P13 yea patients, us, carers and anybody who comes into contact with us they should have the expectation that we are working safely and to the best of our ability

P10 so professional identity is erm your profession, erm adhering to the values of your profession or your professional values as laid out in HCPC and codes of conduct etc. erm

P10 conducting yourself in a manner that's fitting with the attitudes and behaviours of the trust that erm (pause) that doesn't bring the profession into disrepute with the general public

P10 you will behave with respect and with dignity at all times and treat others as you would hope to be treated …….. so being not afraid to stand up for what you believe in but to do so in in a measured, thoughtful and erm experienced way

P12 you you strive to get the best you can and if you can't you explain that in your report what the limitations are or you ask for help erm and its personal responsibility for your actions

One participant (P7) felt that the lack of regulation and associated code of conduct were barriers to employability which was also evident from the literature (Parker & Harrison, 2015). This was despite calls from the Society and College of Radiographers that this should not be seen as such (SCoR, 2013; Thomson, 2009).

P2 mm I think obviously in terms of being employed they would have to have a registration so if they aren't able to have that through the HCPC in a, another area then that would be a barrier to their employment

P3 it's HCPC registration, this trust at the moment won't take anybody without registration

P4 erm I think there's a challenge still in terms of professional registration as well

P7 The employment issue is a huge issue cos it's not just whether or not you'd employ an under graduate sonographer it's the registration issue

There are however, already some Trusts employing non registered sonographers with 25% of Trusts in the UK reporting they employed sonographers without registration with a regulatory body (Thomson, 2015b). This demonstrated examples of where a Trust had removed barriers and provided guidance for non-registered employees to ensure quality assurance but in turn, created local discrepancies. Participants highlighted these differences

P7 it comes down to local decision will they employ someone who does not have er statutory registration some employers will, some employers won't so that's another barrier as well

P6 well they have at the moment cos some trust put it on as a pre requisite before they erm are accept, you know, will, they won't interview people who aren't HCPC registered, but I don't think it has to be that way erm I suppose it's about your professionalism, about somebody, it is quite erm it is quite a threat to feel that you might be struck off if you do something unprofessional

P11 related having a code of conduct and regulation to being able to monitor quality and practice.

P11 and that something will happen if somebody's erm you know working out of their boundaries where you know, discrepancies whatever you like, that there still needs to be somebody who's going to police that

Working within professional boundaries and appreciating your own scope of practice, including limitations (Snaith & Hardy, 2007), are paramount for both HCPC registration (HCPC, 2016) and to meet the requirements of the professional body (SCoR, 2013). However, for non registrants, such as sonographers, alternative methods of ensuring quality are needed which can only be implemented if there is a clearly defined scope of practice or skills base.

4.3.4 Skills base

One of Downie's (cited in Hogg, Hogg & Bentley, 2007) key aspects of being a profession was to have a well defined skills base underpinned by knowledge. However, sonography does not have the benefit of clear professional standards or a code of conduct provided by a regulatory body which are essential for professionalisation (Gibbs, 2013).

In the absence of professional standards, which McGregory, O'Loughlin, Cox, Clarke and Snowden (2009) advocated should be subject to regulatory and professional controls, the United Kingdom Association of Sonographers (UKAS 2008) published guidance standards with subsequent additions from the SCoR (2009). In addition, the SCoR and Royal College of Radiologists (2012) and the SCoR and BMUS (2015) published joint guidance for ultrasound practitioners, none of these bodies however, are regulatory bodies for sonographers.

4.3.4.1 Lower band sonographer

Participants acknowledged the importance of working within a scope of practice with defined skills in association with the lack of clarity for a lower band of sonographer's scope of practice regionally and nationally. Concerns were also raised over the lack of clarity in the literature (Parker & Harrison, 2015).

P6 what I'm not crystal clear about is exactly what their scope of practice would be that's where I think the work needs to be done

P4 so I'm not against it but I think as we said we'd need more information about what role they'd do

P13 I think perhaps more getting an idea of their practicality as well as their academic (pause) status, just as to what they can do

P9 it's, it's knowing what you've got, It's like really, the scope of practice has to be clearly defined not only for the individual who's doing it, but I think the managers of the future,

This lack of clarity requires modelling the way by identifying clear expectations of the role and competencies. This would remove barriers around not knowing what the band 5 or 6 sonographer could perform.

P7 So I think, I think there are an awful lot of barriers being put to the fact that we haven't at the moment got identified roles for band 5 and 6

P4 I think you need to do some, there'll be some challenges in setting up the course, deciding what the content would be

However, whilst some participants struggled with the concept of a lower band sonographer undertaking some areas of the current sonographer's role, others saw potential areas.

P6 I can see certain areas where er it would probably be easier, I can see things like DVT scanning erm some obstetric screening erm things like that where some early pregnancy perhaps where it would fit quite nicely,

P6 or very prescriptive aortas I think you'd be looking at, at what sort of examinations you allowed them to do knowing that there'd be somebody next door who could help them out if they found an unexpected finding

P4 without doing the functional mapping perhaps against that, across that, and perhaps against say imaging assistant and HCA type level duties. You know

what I mean although they're band twos and threes but there might be something there that you could do but at a higher level that would be more generic

Undoubtedly, without this clarity of role, it is difficult for participants to visualise how the lower band sonographer could be integrated into the department. A clear scope of practice would facilitate employability and ideally this would need to be a national driver. P1 recognised the need for a clear skills base but also related it to ensuring the pay was appropriate.

P1 I think it's er challenges in getting the the pay right erm challenges in, you know, looking at the role but I think some of the work erm has been done locally and keen to look at er keen to look at and I think that needs pulling pulling together now er as really with one directive and so that erm we as a manager we know actually what are these people what, what are they going to bring to the service how are we goin to er deliver it, some of the service with different staff

Parker and Harrison (2015) highlighted difficulties in establishing pay scales for a lower band sonographer. Jasa and Kirkland (2009) claimed these could be overcome by incorporating pay into the career structure they developed for American sonographers and aligned it to skills and competencies. It would also ensure all were remunerated at the appropriate level and were actually fulfilling the requirements for that level and therefore, the level of pay would be perceived as justified (Milner & Snaith, 2017). This was also highlighted in an earlier paper by Edwards (2012) who suggested employers needed to ensure they continue to get value for money from the band 7 sonographers.

If a lower band sonographer was introduced this type of career structure would facilitate a clear progression route for UK sonographers which many participants identified as lacking at the minute.

It is acknowledged that the underpinning career structure in sonography is weak with only consultant and band 7 sonographers contributing to the main workforce (Parker & Wolstenhulme, 2012). Many participants spoke about the lack of a career structure for sonographers and saw this as an essential requirement to allow progression.

P6 I think it's very poor, there isn't one is there really so they're, we've got a load of band 7s a few 8as who will either be managerial or clinical lead

P6 very few consultant sonographers so there is no structure really you could be on a band 7 er at the age of 25 erm at the moment even a bit younger than that, erm with no prospect of er any advancement of your er career, so there is none really

P4 if there was going to be revisit of the ultrasound career structure that would be the perfect time to take that into account and try to see how some kind of parity could be

The introduction of a career structure and underpinning new educational model for sonography would facilitate the development of a clearly defined skills base for each level.

However, participants raised concerns over the introduction of a lower band sonographer, particularly at band 5.

P3 I'm not sure if we're doing the right thing if we're trying to build the workforce, I'm not sure if we're doing the right thing by saying lets just do it to a band 5 cos I'm not sure that how many people would be interested in that

P3 I'm thinking what department would support with a band 5 (pause) I think, I think that's a bit harsh really to be fair

P13 could also be that I've worked here, I did three years to get radiographer trained and then I've worked all this time to be a sonographer and got to a band 7 and now they're coming in at a band 5 and they don't have to do all that ,why is that fair ?

P7 and P4 concurred with this and offered a compromise that perhaps the band 5 sonographer would be a qualified sonographer on a preceptorship year awaiting a band 6.

P4 you couldn't just have them step into a band 7 as a newly qualified not when other people have worked you know, five, seven years to get there, I think it would be divisive otherwise

P4 I imagine that they'd, you know, if that, they'd come in, have their preceptorship year, there might be some certain standards and competencies they have to reach before they could then move on

P4's view of preceptorship in relation to pay and banding was supported by the literature (Parker & Harrison, 2015). The preceptorship year is a model being piloted by a UK University as indicated in the introduction chapter. This aligns to the DoH (2010) recommendations for preceptorship (Martin, 2015). The first

cohort was recruited in 2016 and it remains to be seen how the graduates will be employed.

The concerns extended to 'dulling down' of the existing role such as those voiced by P4, P5, P9 and P11 if a lower band sonographer were introduced. This is reaffirmed in the literature (Parker & Harrison, 2015; Walton, 2000).

P4 obviously sonographers aren't going to want to be down banded are they?

P5 we're very, very er in danger of, severely in danger of dulling down everything

P9 I think they feel it's a weakness or a step down to have sonographers at lower grades

P9 I think they're just against it because they feel it's taking away some worth, their, maybe their identity to some extent, maybe they're saying we're watering it down

P11 I don't want to dumb the profession down so much that I think we can all come out as band 5s, I don't think that's right either

Some participants related their visions for the future career pathway for ultrasound practitioners as extended practice of different professionals. P4 and P6 referred to patient care pathways and gave examples of midwife sonographers and physiotherapy sonographers. P5 concurred with this view and stated

P5 I think erm in the future I don't think it will be a career of ultrasound, I think in the future it will be part of a lot of people's job

The use of ultrasound to extend practice by radiographers was also identified by some participants. P4 and P6 identified areas that radiographers may have experience in and take on ultrasound to complement those roles for example, in Computed Tomography (CT) or paediatrics.

4.3.4.2 Educational model

The skills base provided by the current postgraduate education and training, (with the only exception being very small focused areas of practice, for example, Abdominal Aortic Aneurysm screening), was acknowledged by some participants

P6 I think it's a bit about of 'well I had to do an MSc' or 'I had to do a post graduate diploma so why can't they'

P7 but the sonographer has got itself locked into this, you can only do M level, masters level, advanced practice and there's now the difficulty of course is that you can't, we can't keep up with demand with the current M level entry requirements and certainly the current model

P6 (long pause) well it's because of the way it was made into a MSc and the fact that er well Masters level erm

Participants also spoke about the current educational model in relation to the level and split between academic and practice. There was also reference to the historical development of education for radiography.

In the late 1980's radiography education moved away from the traditional diploma level qualification to degree level education (as discussed in the introduction chapter), enabling radiographers to enter higher education and gain the additional skill set associated with a graduate profession (Hogg, Hogg & Bentley, 2007). However, not all participants viewed the move to a graduate degree in radiography as a positive move

P13 I mean I did think when I did it I did the diploma and I think practically the skills were a lot better by the time you'd finished your diploma than perhaps they can be with a degree

According to Downie (cited in Hogg, Hogg & Bentley, 2007) the move from being trained to being educated is also associated with the move to being recognised as a profession. The establishment of a professional body and move to graduate education with underpinning research reinforces the interpretation of a professional. The situation is mirrored in ultrasound where education moved from a Diploma to Masters level education, however, sonography currently lacks a dedicated professional body. Similarities can also be made to nurses' quest for professionalisation as the education was moved from what has been described as an apprentice-style model within the hospital setting into higher education institutes (Willets & Clarke, 2013).

The challenges of the current ultrasound educational models are obvious from the discussions in the previous chapters and with this in mind, the participants

were asked if they could suggest alternative training models and if they thought simulation had a place.

TS do you think that can be er taught in a different way?

P3 no if I'm honest I think having some time in a clinical setting no matter what that setting is, having time just dealing with patients I think that's really valuable

TS yea so things like er change erm supplementing it or using simulation for example instead

P3 it's the interaction with patients that that people lack in if you're not careful

Martin (2015) concurred with this view that simulation could not replace the interaction with patients. Other participants commented on the potential value of the use of simulation.

P11 I think simulation suites are a really good idea and I think, I think maybe if you're looking at under grad erm the first however months could just be spent in simulation and not you know, not touching real patients

Studies suggested simulation was useful for assessing clinical competencies (Harrison, 2015), gaining clinical skills (Gibbs, 2014) and for the development of communication skills (Halket, McKay & Shaw, 2011; Reid-Searle et al., 2014).

The lack of clinical placements was also acknowledged as a limiting factor to the number of trainees and P11 offered a possible solution to this by introducing a practice educator role to alleviate some of the pressure of training from the sonographers.

P11 the only way that departments are going to increase number of clinical placements is some sort of practice educator because they're all saying they're under too much pressure they haven't got time

Parker and Harrison (2015) concurred and found in their study that the lack of training places remained a challenge.

4.3.4.3 Advanced practice

The existing role includes reporting of examinations as a scope of practice (or skills set) and was a result of the role being matched against the Agenda for Change band 7 profile (DoH, 2008). This was undoubtedly influential in this matching to advanced practice, but are sonographers meeting the requirements

for advanced practice and does reporting automatically equate to advanced practice? P7 does not think so

P7 reporting persa I don't think necessarily means I report therefore I'm an advanced practitioner

P7 so it's really the profession accepting that you can report at band 6 and but we've never had any history of that

P7 goes on to explain that in current practice there are examples were a lower band practitioner reports on ultrasound examinations. This is evident in non radiographer sonographers, for example, midwifes and nurses.

However, for radiographer sonographers

P6 so because independent reporting is seen as a band 7 level, band 7 skill erm they automatically get put on to that band 7 so there's nothing underneath

P11 when we were band 5s and band 6s and we weren't doing our own reporting we were answerable to a radiologist

P12 they were sort of the first sort of modality to sort of do the examination and report so hence the banding

P11 raised concerns over the autonomy of the current workforce existing from a piloted educational model

P11 we've been taking part in the pilot for the 3+1 erm, education for er radiographers going straight on to do ultrasound at X and I've taken 3 years worth of er these 3+1 students and erm, I don't believe they come out ready to work erm to hit the ground running to be able to communicate with multi disciplinary people, to answer phones, to deal with queries, to deal with pressure

McGregor et al. (2009) proposed that, for Australian sonographers, the formalisation of reporting would bring professional recognition rather than advanced practice. The Chief Medical Officers Statement of 1994, whilst acknowledging the importance of professional body standards for ultrasound, does not equate the image interpretation (an early precursor to reporting) to a specific level of practice but to adequate training or skills base (Walton, 2001). The Oxford dictionary definition also defined professionalism in relation to skill and competence, however, the HCPC (2014b) believed it was more than a skills set. They argued that whilst professionalism was not well defined, it was reliant

on the interactions between the practitioner and patient and should be contextualised. They believed judgement played a key role in professionalism and rather than being a matter of *what to do*, it related more to *when to do it*. Similarities can be drawn from the work of Carr (cited in Cole, 2002) who described this professional action as not necessarily taking the 'right' action but taking the 'best' action in that particular circumstance. Taking the 'best' action can therefore, lead to conflict between being professional and evidence based practice and protocols. Cole (2002) argued that professionalism comes into play where the protocol ends and being professional is therefore much more than completing tasks (technical work); it involves using judgements (professional practice) and requires critical reflection, evaluation and expertise to resolve issues and dilemmas ("Professional nursing judgement", 2009). However, this would then possibly jeopardise the 'professionalism' of the future sonographer workforce if we consider the work of Cole (2002) who believed that professional practice required the utilisation of professional judgement which required additional skills to those considered purely technical skills. The HCPC (2014b) argued these additional skills included communication, technical and practical skills which are learnt early in life and through education and role modelling. This was reflected in the recently published HCPC (2016) version of the code of conduct, performance and ethics.

Professional and clinical judgement is therefore much more than a reflective process and involves deliberation (Cole, 2002) which is essential for advancement of roles (Hardy & Snaith, 2006; Hardy et al., 2008; Kelly et al., 2008; McInerney & Baird, 2016; Parker & Wolstenhulme, 2012; Snaith & Hardy, 2007).

Dewey (cited in McInerney & Baird, 2016) believed that reflection, interpretation, judgement and planning are key aspects of critical thinking and require attributes such as open mindedness, wholeheartedness and intellectual responsibility. It was suggested that this deepened understanding and decisions on how best to act (Tanner, 2006) as well as giving transformative learning and vision for new practice (Sim & Radloff, 2008). Reference can be made back to acting in the patient's best interests, ethical dilemmas and also responsibility in moral identity. Considering these along with Sim and Radloff's (2008)

transformative learning and vision for new practice could make the difference in leading sonography and facilitating a clear professional identity and true professionalisation.

Advanced practitioners should be local trailblazers capable of implementing change (Hogg, Hogg & Bentley, 2007) and hold attributes such as critical thinking and professional judgement (McInerney & Baird, 2016).

It was thought P6, P9 and P12 were alluding to this in the statements related to the complexity of cases which required more critical thinking and autonomy.

P6 so where, where the line between 5 to 6 and 6 to 7 is, is where we need to do more work. I feel it's probably more about the complexity of what we're looking for erm but that's hard to predict from the referral

P9 you know, right at the end they might be able to perform a scan but we're still taking the responsibility, as a band 6, straight forward walk in looking for gall stones on a very slim patient who's not in bed, you know,

P9 you know they can at band 6 they're doing this - let's measure this, measure that, da di da at band 7, there's more to it

P12 I think because they were, I might be wrong, they were sort of the first sort of modality to sort of do the examination and report so hence the banding erm because it's again an autonomous role and it's got consequences to, to your actions and your reports

Whilst the importance of critical thinking has been debated greatly in relation to nursing and the medical profession, less has been published relating to radiography (McInerney & Baird, 2016). However, it is considered an essential aspect and some authors would argue even more important in professions associated with advancement of technology, such as radiography (ibid).

As previously acknowledged the HCPC (2016) stipulated registrants must be able to justify their decisions and be accountable. However, not all sonographers are HCPC (or other regulatory body registered). This professional accountability and responsibility was acknowledged by participants.

P6 they're not going to be HCPC registered so what are we going to put in place instead, what quality, what quality measures are we going to have? erm they can be developed, but they would have to be in place, for their professionalism, accountability, those sorts of things

P12 somebody's got to be accountable it would seem, the problem is that medicine is not an exact science

P13 I guess it's not 100% guaranteed but I think if you have somebody who is like that they will take on responsibility as well it's also about them being able to understand how responsible a job it is as well.

Being responsible and undertaking autonomous practice was reflected in the current job description for reporting sonographers and highlighted they were accountable for their own professional actions, including reporting (NHS Employers, 2006, p. 8).

Therefore, this autonomous and accountable practice related to advanced practice for radiographers does not merely reflect an extension of practice, although the differentiation is poorly understood (Eddy, 2008; Hardy et al., 2008; Milner & Snaith, 2017). Milner and Snaith (2017) argued that this was not unique to radiographers but common to other health professionals and was recognised by the Department of Health (DoH, 2006). Advanced practice includes four core functions essential for higher level practice; expert clinical practice, professional leadership and consultancy, education training and development, and practice and service development, research and audit (Coleman, 2013; DoH, 2000; Freeman, 2010). As discussed in the literature review chapter, the SCoR developed an accreditation system for advanced practitioners to apply for. However, interestingly Milner and Snaith (2017) found that whilst just over half of their sample of advanced radiographic practitioners had heard of the system, only 2.9% of them had accreditation. Nationally, the total figures for accreditation, as of March 2017, were 40 radiographers; 26 advanced practitioners and 14 consultant practitioners. Of these 40, 4 were sonographers; 2 advanced practitioners and 2 consultant practitioners (L. Coleman, personal communication, 2017).

Additionally, whilst there is an expectation that advanced practitioners hold a full Masters level qualification, this is often not the case (Thomson, 2015b). This is mirrored in both radiography and sonography (CASE, n.d.; Milner & Snaith, 2017) and it was recommended that further research was required to explore if pay, academic achievement and career progression are linked (Milner & Snaith, 2107). This was evidenced as possible in America by Jasa & Kirkland (2009)

where different bandings of sonographers were employed dependant on academic achievement and skills sets.

The lack of radiographers and sonographers holding full Masters level qualifications leads to a lack of underpinning research for the existing knowledge base; something deemed essential for professional identity (Blane, cited in Adams & Smith, 2003). In addition, the professional and regulatory standards should benefit from this underpinning body of knowledge and research and should be continually reviewed and refreshed (Downie, cited in Hogg, Hogg & Bentley, 2007; Giddens, 2010; Hogg, Hogg & Bentley, 2007).

Should one essential element of the definition of professional identity be missing, for example, the underpinning knowledge base, then this can lead to the profession being perceived as a semi profession (Friedson, 1970). Unfortunately, in the past radiography has been accused of being a 'semi profession' due to the lack of research active radiographers (Adams & Smith, 2003; Nixon, 2001). In more recent years the SCoR have invested in increasing the research profile of the profession with the introduction of the research group in 2002 (SCoR, n.d.d) and subsequent publications of research strategies for the profession (Harris, 2015; Probst, Gallagher & Harris, 2011; Reeves, Wright, Shelley & Williams, 2004). The formation of the consultant radiographers' group in 2006 (SCoR, n.d.c) assisted in driving this agenda forward. Despite calls for the profession to lead the way by engaging in formal and informal groups to promote research to the wider profession (Snaith, Harris & Harris, 2016), the research activity of consultant radiographers is sadly reported as still relatively low (Harris & Paterson, 2016). However, it is acknowledged that it is not only the domain of consultant radiographers but also expected of advanced practitioners. Despite research being one of the 4 core requirements for advanced and consultant roles (DoH, 2000) the research activity of these groups was claimed to be at a relatively low level (Milner & Snaith, 2017).

This is disappointing, considering a key objective of the SCoR research group was to further increase and promote research within the profession and build on the research skills developed as part of the higher education courses in radiography in the UK. They claimed this would establish, refine and add to

'radiography's unique body of knowledge' (SCoR, n.d.d). Despite this it was claimed radiography lacked a research culture, evidenced by the small number of radiographers achieving Doctoral level study in comparison to other AHPs and nurses (Probst et al., 2015; Snaith, Harris & Harris, 2016).

There were a much smaller number of sonographer representatives at these (and indeed national groups as a whole) and this was echoed by a few of the participants as previously indicated. It is recognised that the constitution of the SCoR research group does not include any sonography representation, perhaps a reflection of the low numbers of consultant sonographers nationally (15 out of a total of 84, SCoR, n.d.c).

4.4 Being in control

Medical dominance of the radiography profession can be partially attributed to the historical development of the occupational groups of radiographer and radiologist, as outlined in the introduction chapter. This is not unique to radiography and is frequently reported in relation to nursing as division of labour occurred (Machin, Machin & Pearson, 2012; Nolan, 2012; Ohlen & Segesten, 1998; Willets & Clarke, 2013; Yielder, 2006) as females took over the more nurturing and caring aspects of the doctors' roles (Witz, 1992). Adamson, Kenny and Wilson-Barnett (1995) stated that this dominance is maintained by their professional autonomy whilst Yielder (2006) claimed it was associated with diagnosis within medical imaging. Non-medically trained radiographers were prevented from offering any diagnosis through reporting in the 1930's leading to de-professionalisation (Porter 1991; Price & Paterson, 1996) and restricted efficacy. The more mundane and tedious activities were delegated to radiographers from radiologists in an attempt to gain higher status from their medical colleagues (Ferris, 2005) which Larkin (1983) termed *occupational imperialism.*

The medical dominance over radiographers (and other health professions) has also been aligned to the gender differences. Powell (cited in Yielder, 2006) believed the success of the medical profession was as a result of 'its upper middleclass male' members rather than holding specialist knowledge, whereas radiography and nursing were deemed more female dominated professions.

Witz (1992) argued that this emphasised the patriarchal control over the occupational demarcations.

4.4.1 Being Protectionist

The *being protectionist* (4.4.1.) sub category saw the emergence of different occupational groups demonstrating protectionism towards their own roles which interlinks with *maintaining professional boundaries* (4.4.2.) but also towards the profession, the employer and the patient. A reoccurring notion through this sub category related to regulation, or in the case of sonography, the lack of it which in itself was termed a contentious issue (Parker & Harrison, 2015).

A regulator's role is to protect the public, usually by means of keeping a register and ensuring registrants continue to meet the standards of the regulatory body they set.

4.4.1.1 Protecting the public

Some participants related public safety to the mechanism of HCPC registration. P1 identified HCPC registration as important in protecting the public in terms of fitness to practice cases and the reporting of these so other employers would be aware. They described this as a 'real must'. This was also reiterated by P3, P4 and P7 and is evidenced in the literature by Thomson and Paterson (2014).

P7 I think some employers do strongly feel that unless someone is statutory registered they've got no-one to report them to in the event of any er problems

P1 it's what would you do if there was a fitness to practise, where would you take that……If it's somebody who's HCPC erm you've had to refer them to that and then there's something on the, on the system at least

P3 if you do anything wrong then it goes onto your file and everybody will know about it.

P3 as an employer you can see if they've been struck off the HCPC

P4 believed this related to quality assurance and maintaining registration was demonstrating you had certain qualifications and experience.

P4 well my thought was if you were erm registered with them you have to provide evidence to show the qualifications and experience that you've got and you have to maintain that registration I think it's annually now? Yes so in a way that is a quality assurance for employers that people have met a certain standards so it's like it's almost like an accreditation

P4 in the follow up interview also related regulation to professional identity and someone being able to demonstrate 'job readiness'. They stated that registration provided a specification and demonstration of certain competence to employers. P7 however, thought this was a misconception of employers

P7 some employers make a mistake, they say statutory registration equals competence, no it doesn't; statutory registration makes no statement about someone's competence

In contrast, Walton (2001) advocated that competence came from following an educational programme rather than from regulation by a professional body, with Lovegrove and Price (2002) concurring that competence was aligned to formal training. Competence was described as the single most important aspect of an ultrasound scan (Graham, Andrist & Schroedter, 2002). Gibbs (2013) further linked competence to professionalisation.

Protecting the public also raised comments relating to seeing the right person at the right time.

P5 so as long as it's done properly by the right people, with the right equipment, it doesn't necessarily have to be done in a radiology department

P4 related this to obstetric scanning where midwife sonographers performing scans could potentially alleviate the need for a longer wait for a sonographer scan. As previously discussed, this was highlighted in relation to occupational groups using ultrasound to extend their professional practice, rather than ultrasound being their career.

4.4.1.2 Protecting the Employer

The latest figures available demonstrated a workforce deficit of 10% for sonographers (CfWI, 2012; CfWI, 2017; Thomson, 2014) with widespread sonographer vacancies. This has created an employees' market in that sonographers can pick and choose where they want to work and command their terms and conditions including pay, making staff retention paramount for employers. Some participants spoke about retention of sonographers and how they could achieve this. This related to protecting the hospital Trust in terms of being able to maintain and deliver service. P2 mentioned this in relation to providing a career pathway and CPD opportunities. P4 advocated Trusts should

be working collaboratively to increase retention by avoiding the situation of 'poaching' staff from each other. P7 also identified the issues of 'poaching' sonographers from neighbouring areas by offering higher bandings.

P4 (pause) well I think in the past actually trusts and hospitals haven't been very sensible in the fact that they've often poached staff off each other

The situation was compounded by the increased demand for diagnostic services year on year with ultrasound specifically showing a 4.1% increase in the table below (NHS England, 2016).

Year	**Ultrasound examinations**
2012/13	7,687,850
2013/14	8,140,175
2014/15	8,566,470
2015/16	8,916,225

Table 8 from NHS England Diagnostic Imaging Dataset 2015/16 (2016).

Participants highlighted the increase in service demands and pressure to meet services.

P3 yes it's high demand, both sites are high demand so erm that's where the pressure comes from and targets, to meet your targets all the time

P1 yes, er I mean the er pressures are increasing in demand for ultrasound both general and er obstetrics erm there's more erm standard setting obstetric scanning and er you know such as FASP, so there's been increase in that, an increase in birth rate erm older people living longer erm other NICE guidelines and I think it's just a multitude of everything and then obviously erm issues with recruitment

4.4.2 Maintaining Professional boundaries

Being a member of a group and having a clearly defined scope of practice is undoubtedly important for professional recognition as discussed in section 4.3.1. Team functioning is further improved when there are common goals (Cashman et al, 2004) and the team members must co-ordinate and work together to achieve these shared goals (Levi, 2011). This can be strengthened by clear group or professional boundaries through categorisation in Social Identity Theory (Hogg, Terry & White, 1995).

P9 stated the desire to be part of a team and also recognised the importance of working together whilst challenging professional boundaries

P9 like to have, I'd like to feel part of the team and I like to be erm I like them to teach me

The professional boundaries of radiographic practice are not clearly defined (Nancarrow & Borthwick, 2005), explained by the historical development and constraint of the profession which imposed culturally embedded values and expectations (King & Ross, 2004).

In addition, radiographers (including sonographers) have challenged traditional boundaries in order to advance the profession, which has been recognised both by the professional body and national policy. One such example was from the SCoR (Thomson, 2009, p 5) who supported the view of changing responsibilities in their statement, 'Consultant radiographers will challenge boundaries and inspire the future'.

However, since this publication eight years ago, some authors have argued that there is a lack of research to demonstrate the measurable impact consultant radiographers have had on practice (Henwood, Booth & Miller, 2016). Despite this there continues to be support for consultant radiographer posts and associated skill mix with exemplary practice in radiography led services for example (Chief Allied Health Professions Officer's team, 2017; Snaith & Hardy, 2013).

The issues of professional boundaries and breaking them down were raised by participants who emphasised the difficulties with this.

P6 it should be a good thing, it should be a good thing but it’s the professional boundaries that prevent that because a lot of, a lot of people I see and speak to just can’t get past that in the current work force

P6 so I feel that erm in terms of more higher areas then more consultant sonographers so why hasn’t that happened I think that’s mainly down to lack of funding and in some instances the erm the consultant radiologists not supporting it and not wanting to let go

Here they recognised that the radiologist was being protectionist of their own role and striving to maintain the professional boundaries by being reluctant to

delegate roles to sonographers. Price (2017, page online) claimed this was still evident today in a recent report from the Royal College of Radiologists (2017).

> 'The tragedy of the latest statement is that out of 1158 words, 404 are spent not in making the case for better patient services but instead in denigrating and undervaluing the capabilities of advanced practitioner radiographers'

The position is not unique to the UK as McGregor et al. (2009) reported on an editorial comment in Australasian Radiology Journal that called for high levels of recruitment of radiologists to avoid professional encroachment from other groups.

Comparisons can be drawn to the current sonographer workforce being reluctant to delegate roles to a lower band sonographer. This was evident from the literature where it was stated that this proposal could possibly water down or 'dull down' the current sonographer role (Parker & Harrison, 2015; Walton, 2000). Participants also related to this 'dulling' down as seen in the *skills base* section. It was also reflected in the resistance to change section. This gatekeeping maintained professional demarcations between occupational groups and allowed the exertion of power and control over entry to the 'group' (sonography). Definitions of gatekeeping often relate to control, for example, 'the activity of controlling, and usually limiting, general access to something' (The Oxford Dictionary, n.d.) and 'when someone takes it upon themselves to decide who does or does not have access or rights to a community or identity.' (Urban Dictionary, n.d.).

4.4.2.1 Sonographers as gatekeepers

P6 spoke about the opinions of others in relation to there being a requirement for a cultural challenge.

P6 so I think if we did accept younger people erm we'd have a little bit of work to do with the current workforce to erm make sure we got their support, so that's the major cultural thing - it's more or less we've always done it this way so erm this new way won't work.

P7 concurred with this view and believed it was about 'hearts and minds' and gaining support from the current sonographer workforce. Participants inferred sonographers wanted to protect their own role, with some indicating they would

be against a lower band sonographer being introduced. It was suggested sonographers saw this as a threat to their current role as invariably it would lead to changing professional boundaries.

P5 was against the introduction of a lower band sonographer due to the lack of prior knowledge in a clinical specialty but also related this to the potential age and immaturity of direct entry students.

P5 I wouldn't want my children doing that at that age and I don't think it's appropriate I think they need more experience before they do that kind of thing

Concerns were raised relating to the exposure to highly emotional scenarios, such as infant death for example. P3 also referred to 'youngsters' and felt it was not appropriate for them to go into obstetrics. Some participants expanded this to the lack of experience of health care or in dealing with patients. P5 discussed the importance of having an understanding of the role before training whereas other participants related this to having some exposure to patients/customers prior to being accepted on the course.

P3 but not necessarily need to be a caring background but it's got to have some kind of patient/customer experience in life

P5 yes I mean the other alternative obviously would be to put some sort of age in and that is a possibility but I still think that they need, experience, not only of life but of something around the hospital some err experience of death, illness and terminal illness and death of babies if it's obstetrics or whatever

One participant also raised the importance of access to 'real' patients and when asked about the use of simulation to enhance this, the response was negative and included an almost warning 'if you're not careful'.

P3 it's the interaction with patients that that people lack in if you're not careful

P10 related experience to 'life skills'

P10 sometimes as with a lot of life skills, you might have somebody who's maybe done shop work as a teenager that might come with that ability to communicate with the public

Parker and Harrison's study (2015) confirmed concerns existed in the current workforce related to the lack of life experiences. As aforementioned, some participants related previous experience to a particular clinical area.

P5 so yes I would employ a nurse with no, or physio or, or a radiographer, or an OT or anybody with the right skills and experience with rheumatology to do rheumatology ultrasound but I wouldn't employ a new graduate, no

TS ok so what do you think would need to change to facilitate that

P5 I don't think it would

Both P5, P6 and P11 spoke about the value of experience allowing the sonographer to recognise abnormal findings. P7 outlined the difference between undertaking a training course and having experience.

P7 to take on that practice they are not, you cannot gain that experience of a sonographer just because you've done a CASE accredited course you need the time as well and erm it takes time to get to that point where a really experienced sonographer puts the probe on and you almost know from the moment from putting the probe on there's a problem erm it's almost a sixth sense

It was evident that participants had a tendency to place greater emphasis, complexity and difficulty on their own particular area of practice and creating favouritism towards their own area of clinical interest or expertise.

P6 I think it's a bit about the professional, erm about them protecting their own work,

For example, P6's area of expertise was abdominal ultrasound, P3's was obstetric ultrasound and P5's musculoskeletal ultrasound. The following quotes demonstrated gatekeeping their own area of expertise and maintaining their own professional boundaries.

P6 general abdominal and gynae where you really don't know what you're going to get, 'fishing trip' from a GP, might be more difficult

P5 we can't recruit locums cos it's a specialised post in rheumatology so erm that's caused problems

P5 In our area even more so, with due respect to other areas, even more so in MSK it demands a knowledge of MSK disease, before or during and clinical work whilst you're doing the scanning

P1 concurred with the view that sonographers wanted to protect their own role and made comparisons to the historical context of radiographers resisting the introduction of assistant practitioners in the early 2000's. At that time assistant practitioners were seen as a threat to radiographers as they were trained to

undertake some of their roles. Similar resistance was evident in some of the participants' responses when asked if they thought the introduction of a lower band sonographer would free up the current workforce to advance their clinical skills, the answer was ‘no’.

P1 erm I think certain people don’t like change erm they’re trying to protect their own role erm and I think it it’s, you know, probably was the same with radiographers and assistant practitioners

Both P4, P5 and P13 described sonographers as being ‘special’ and who wanted to maintain this ‘status’. One could argue this is maintaining the professional boundaries by being in a shortage profession. If the market was flooded, the workforce deficit would be reduced and sonographers would perhaps become less ‘special’ as competition for employment and CPD opportunities would increase and high pay demands would become a thing of the past.

P11 expanded this feeling of being special to radiographers.

P11 we’ve always been a bit up ourselves, that’s what somebody’s said to me recently, that radiographers have always been up themselves and they always think they’re something special

Relevance to perceived positional power can also be made here.

P11 spoke about trust and being able to trust someone to take on their role.

P11 I’ve got to trust that I’ve delegated the task or you know, they’ve been given a task and they’re carrying it out to advance practice level if they’re going to make a clinical decision erm that’s going to take somebody to theatre or erm you know, affect somebody’s patient management and diagnose a fetal abnormality I need to trust that person, erm and I think that comes with experience and I don’t think as an under graduate they’re going to get that experience.

Here P11 related trust to experience and being able to carry out a delegated task to the appropriate level.

4.4.2.2 Radiologists as gatekeepers

The current Masters level education and matching of sonographers through AfC means there are no lower band sonographers and few consultant sonographers at the opposite end of the scale as previously discussed. It is worth noting here

that the term 'lower band sonographer' refers to someone undertaking a range of ultrasound examinations rather than a very focused scope of practice (as in AAA screening) or in a particular clinical area to extend their professional skills (for example, midwife sonographers). P6 blamed the lack of opportunities for consultant practice on the shortage of funding and radiologists' reluctance to delegate tasks to sonographers as reasons for this.

P6 I think that's mainly down to lack of funding and in some instances the erm the consultant radiologists not supporting it and not wanting to let go

P6 and I think in some erm trusts erm that's a very big problem, here we're managing to break down those barriers slowly but I do feel in some trusts especially the older radiologists you know who don't want to let go

This variation in support from radiologists for radiographers to achieve consultant roles was identified by Henwood, Booth and Miller (2016). Authors claimed barriers still exist centred around the lack of medical knowledge radiographers hold to make clinical decisions (Donovan & Manning, 2006; Lovegrove & Long, 2012; Price, 2017; Rees, 2014). Harris and Paterson (2016) described how this 'subservient' relationship could hinder progression for radiographers, making them different from other AHP groups. P9 identified this difference

P9 erm you know, they're the ones who erm at certain levels sing our praises and raise our profile you know, whether, it's that that trust I think is unique in radiology

This however, often resulted in hierarchical boundaries being imposed by radiologists leading to conflict (Harris & Paterson, 2016; Yielder, 2006). Despite this reluctance to delegate roles, participants claimed radiologists did not necessarily want to do the roles either. P6 quoted radiologists as delivering less than 10% of the ultrasound service if musculoskeletal work was taken out, and stated

P6 it's almost like they're not doing the work but they don't want to give it up

It would seem to be inevitable that radiographers seek role development which, in turn, could prompt territorial conflict from radiologists as they feel threatened and attempt to protect their own areas of practice (Woodford, 2006).

P9 erm yea I think because, it's that old thing in't it radiologists do feel threatened

P11 I still think the radiologists are trying to keep, keep control

This keeping control was also evident in the literature and reported by Harris and Paterson (2016) in their study. P11 claimed this was compounded by radiologists holding the post of head of clinical or diagnostic services and therefore preventing radiographers from developing and implementing change (Harris & Paterson, 2016; Kelly, Piper & Nightingale, 2008).

P11 I still think the radiologists are trying to keep, keep control and most of the HoCS in department are still radiologists erm

This is also evident in the historical section of the introduction chapter which outlines how radiologists formed and led the professional body for radiographers, (the Society of Radiographers) in an attempt to exert control over radiographers and then subsequently placed radiographers under direct supervision of radiologists through the British Medical Association in 1939.

P11 also recognised any changes made that threatened radiologist control were not well received

P11 yes I think things are changing with the new appointment of the erm lead for radiology training in X which has caused an absolute uproar at my trust, so much so that the radiologists have written erm so yes I think things are changing but I don't think they're happy about it

In relation to the ultrasound department

P11 and there's become, there's become, there has become a real rift between radio and they're not, they're not approachable or anything they're just, they see themselves as separate, separate from the ultrasound department, totally separate, apart from the little bit when they come in and dabble and doing the bit that they want to do

4.4.2.3 Employers as gatekeepers

Employers using HCPC registration as gatekeeping was mentioned by P3, P5, P6, P7 and P11. P7 also identified discrepancies within the same hospital Trust where imaging sonographers had to be HCPC registered but vascular sonographers did not, which is explored more fully under the code of conduct section.

The career structure (or lack of it for sonographers) was also referred to by participants and seen as gatekeeping sonographers at a particular banding with little opportunity for career and role development. P6 spoke about there not being a career structure and how sonographers currently can be on a band 7 at the age of 25 years old and have no career pathway in front of them unless they go into management or clinical lead. The call for a regional, if not national, approach was voiced by some participants (P4 and P6).

Managers were also seen as gatekeepers in relation to introducing new educational models and access to training.

P1 I think, I think erm there's, there's people within the profession that, and I would imagine there's managers that probably can't get their heads round it and don't want it

P5 certain superintendents have been reluctant to allow radiographers off from doing radiography to do ultrasound

As aforementioned, it is recognised that managers can limit opportunities.

4.5 Managing change

The managing change category is sub divided into three sub categories, *resisting change, exploring alternatives* and *implementing change*.

Many participants talked about the resistance to change from the existing workforce and managers, which linked to the *being in control* category (4.4.). Participants also made connections between managing change and leadership from within the profession to facilitate any change. Participants felt that clear leadership to manage change would be key in addressing the workforce deficit and allowing different training models to produce employable sonographers.

The blurring between the roles of leadership and management is compounded by the terms often being interchanged (Rost, cited in Yielder, 2006). The roles themselves are often both expected of post holders who are anticipated to be proficient in each (McCaffery, 2010). Yielder and Davis (2009) argued that, despite this confusion, there was undoubtedly some overlap between leadership and management which provided optimal success in many areas.

Bennis and Nanus (1997) outlined the differences between leadership and management as significant with management being able to accomplish activities and master the routine whereas leadership influenced others and created visions for change. Kotter (1990 and 2010) concurred with this view and defined management as the ability to get tasks done through others and was concerned with organising, problem solving, planning and providing order. McCaffery (2010) described these as 'organizing activities' with associated functions such as planning, staffing, budgeting, co-ordinating and decision making. In contrast, leadership is the art of getting others to undertake tasks by establishing direction, aligning people, motivating and inspiring to produce or manage change rather than resist it (Kotter, 1990).

McCaffery (2010) compared management and leadership to transactional and transformational leadership. He suggested that a management role could be conducted in a cool, role orientated manner (transactional), whereas the leadership role required the 'followers' to consent to being led (transformed) and involved emotions. The management role aligned to transactional leadership and used contingent reward when goals were achieved but there was no focus on individual development, instead reward and benefits were in exchange for loyalty and compliance (Burns, 1978). An alternative transactional leadership factor is ‘management-by-exception’ utilising corrective criticism, negative feedback and negative reinforcement (Northouse, 2015).

Kotter (1990 and 2010) advocated that management facilitated order and achievement of short term goals but could stifle long term goals due to the lack of risk taking and creativity. It does however, compensate for weak leadership which can lead to change for change's sake in contrast to strong leadership which has the capability for effective change (Kotter, 1990). Yielder (2006) claimed that management roles were more prominent in radiology departments which led to power and influence which can be aligned to Northouse's positional power (2015) previously discussed under the leadership section. Yielder (2006) stated that this positional power allowed the withholding of benefits and can be aligned to managers gatekeeping access to training or role development for example. Managers hold authority through a title for example, whereas leaders hold acceptance from 'followers' through their personal characteristics (Law &

Glover, 2000) and are influential rather than authoritative (Rost, cited in Yielder, 2006). Adamson et al. (1995) and Duffield (1986) suggested that medical dominance was achieved through exertion of authority over other health professionals and imposing limitations and exclusions on their practice.

4.5.1 Resisting change

Whilst the overlap between resisting change and being protectionist is explored in the *being in control* section (4.4) and associated memo writing, participants also acknowledged the need for change but could not necessarily offer any solutions or potential ways forward.

P6 something's got to happen so we've got to try and find a way of erm making the training of a sonographer, erm not waiting until they've done a degree then another two years, erm it's just too long

P6 We can't keep waiting 5 years to deliver a sonographer, who might have done a radiography degree that they're now not using

Participants spoke about the existing workforce being comfortable with the current structure and being resistant to change.

P4 so obviously established people who are quite comfortable with the current career structure will have something to say about it, would need convincing they're often the ones with the skills that you need to erm capture, so you really need them on board but I think that's going to be a large challenge

The lack of clarity on the roles a lower band sonographer would perform seemed to be a major hurdle as previously discussed. This would require modelling the way by identifying course content and having clear expectations of the role and competencies following successful completion of the course. This would remove barriers around the uncertainties associated with the scope of practice of a band 5 or 6 sonographer. In light of the lack of national directive for educational change, Universities have developed their own, and in some cases very different, educational routes for the future sonography workforce.

P7 I think there are an awful lot of barriers being put to the fact that we haven't at the moment got identified roles for band 5 and 6

P4 I think you need to do some, there'll be some challenges in setting up the course deciding what the content would be

P3 also indicated they would not employ a sonographer graduate without clearer information. It is reasonable to assume that this related to the scope of practice and role specification as other participants related to the lack of national or even regional guidance on the scope of practice and educational models. Due to the lack of clarity on the role, it also follows that there is interlinking to no clarity on the pay and career structure. Until the core competencies have been established, the role cannot be matched against the Agenda for Change and other key performance indicators.

The requirement for this to be a national rather than local drive was raised by many participants and P7 warned against local initiatives.

P7 if you start doing local initiatives that perhaps to perhaps bring on people and say have locally extended pay scales bands or whatever, you then get internal problems for trusts that are reluctant to do it because you end up with the sonographer being paid more than the manager in the, the X-ray department

A national drive was perceived to facilitate a greater acceptance by the profession itself and existing workforce, for example,

P4 to gain, to gain exposure and also erm higher level kind of acceptance and support from leading sonographers to try and overcome some of the local resistance we might find cos then it would be a bit of a, you know it wouldn't just be 'oh managers are trying to do this to us', it needs to be owned by the profession

P11 so something's got to change nationally and I know obviously there are, there are some in roads happening but I don't really want it to be eroded in such a way that some pe, places are employing em, some places aren't, I'd rather there be something that we could all do

Participants also spoke about the resistance from sonographers related to their own role and training. For example, P13 stated

P13 It can sometimes feel like (pause) you're going to have things taken off you perhaps or what am I going to lose

P13 could also be that I've worked here, I did three years to get radiographer trained and then I've worked all this time to be a sonographer and got to a band 7 and now they're coming in at a band 5 and they don't have to do all that, why is that fair?

This reference to sonographers own experience and training and 'why should we do things differently?' was a reoccurring notion and can be seen above in the training route as well as previously in the educational level studied for example. There seemed reluctance to explore other options which are not embedded into the professional culture and have been developed through socialisation and participation in the role associated with the occupational group (Hashimoto et al., 2014; Lave & Wenger, 1991; Strudwick, Mackay & Hicks, 2012). These learnt behaviours are then passed on to new members of staff which can be detrimental to professional growth (Strudwick et al., 2012). Nolan (2012) reported a similar scenario in the nursing profession where the culture of the hospital was passed on to nurse trainees, who were then expected to remain in employment at the same site and pass this culture on to the next generation of staff. It is worthy of note here that there are two traditional avenues for terming culture; one associated culture with being an attribute that an organization has and the 2nd focused on what the organisation is, constructed by social interpretations (Scott, Mannion, Davies & Marshall, 2003). One could argue Nolan (2012) above was aligning culture as an attribute and Strudwick et al. (2012) aligning to a social construct.

4.5.2 Exploring alternatives

Most participants acknowledged that a clear vision of what lower band sonographer skills and competence would be is lacking. As discussed previously, this makes it difficult to imagine a different career pathway or structure and therefore, facilitate employability. Some alternatives were offered related to some very focussed areas a lower band sonographer could perform but it is fair to say these represented superficial options and not a wider restructure and clear career pathway. New career pathways related to disaggregation of ultrasound services and following patient pathways were discussed as a possibility by P4, P5 and P6.

Comparisons to the nursing and midwifery historical split were raised by participants whilst acknowledging the key difference of the regulatory body's role; the Nursing and Midwifery Council (NMC) recognising both areas.

P1 I think it's a possibility because erm that's what nursing's done erm I mean midwives traditionally they were always nurses who then went to midwife er training now they come in and they train as midwives so why shouldn't a sonographer? I mean obviously there's still the burning issue of the HCPC registration

P1 so it's worked from midwifery so why can't it work for sonography?

P6 so certainly regionally or nationally people would feel more comfortable cos that's the way we go, just like when we changed it to a degree program, we changed it from a DMU to a, or when midwifery went from a, how they changed with their, what was it -something 2000 when they changed theirs it was a national thing

P7 I think there are parallels in that the the, situation in midwifery was that they're weren't enough midwives and if you remember the traditional model was that you had to train as a nurse first then you did, you did what they call your Mida erm and then you qualified as a midwife so then you were qualified as a nurse and a midwife.

On reviewing the historical development of midwifery as a distinct profession rather than what has been termed a sub discipline of nursing (Farsides, 2002), parallels can be made to radiography and sonography. Stevens (2010) highlighted the heated debate which preceded this split in the late 1980's with two distinct sides. One argument was adamant that a midwife without any nursing background would not be safe to practise whereas the opposing opinion was that midwives should be autonomous. Participants raised concerns over direct entry sonographers having no background in imaging, health care or previous patient contact as outlined above.

This desire for autonomy for midwifery was documented as they strived for status and professional recognition; something sonography also appears to be aspiring to (Lovegrove & Price, 2002; Parker & Wolstenhulme, 2012). Farsides (2002) claimed that self regulation led to autonomy and professional recognition and could be achieved by the occupational group setting their own entry requirements, standards and procedures for disciplinary action for example. Sonography also lacks self regulation by Farsides' (2002) definition as standards are currently set by a professional body of a different professional group. Participants complained about the representation of sonographers on national boards.

P11 and I think having one representative on the, in the Society (pause) that you know, represents the whole of the sonographers in the country you know is that right? Erm and same with the HCPC. I mean the, some of the decisions that HCPC are saying that sonographers and radiographers are making, when there's like one radiologist sitting on the council

The introduction of regulation for midwives in America, signified them being accepted as professionals with codes of practice and an underpinning knowledge base to demonstrate competence (Davis-Floyd, 1998). Prior to this it was claimed anyone could use the term and practise as a midwife; a similar scenario to sonographers in the UK today. However, one participant offered an alternative method for non registration with the HCPC, which can be compared to self regulation.

P11 the cardiac technicians they have their own conference, they have their own, you know, it's no difference why would it be any different do we look at them any less that they're not HCPC registered.

Farsides (2002) also claimed medical dominance restricted midwives to the more mundane work which they justified through claims of holding specialist knowledge which can be compared to the historical development of radiography. Interestingly, it was claimed midwives would defend their autonomy through the development of additional skills and knowledge to demonstrate their worth, rather than through territorial battles (Farsides, 2002). Demonstrating worth was identified as a necessity for sonographers (Edwards, 2012), although it is difficult to imagine how this could be facilitated through the current career structure and workforce deficits. Participants highlighted this concern.

P4 we may want people to do more advanced practice for instance FNAs, people are currently doing them in terms of scanning but they're not doing the biopsies

P4 it's hard to release people to do the training or take on extra lists of their own because we need to keep the core staff in the department just to keep what service we've got at the moment running

4.5.3 Implementing change

Change management within organisations is seen as an essential component of health reform (Scott et al., 2003) but it is claimed it is often implemented

suboptimally (Allen, 2016). This can have devastating effects on staff morale, retention and acceptance of any future changes (Tvedt, Saksvik & Nytrø cited in Allen, 2016). It is therefore, essential that good practice for managing change is followed whilst capitalising on the aspects of professional culture such as team work and collaboration. Scott, Mannion, Davies and Marshall (2003) described two orders of cultural change with the first order related to doing what you already do but better and the 2nd order related to a change *of* culture rather than a change *in* culture and was often implemented in response to a growing crisis.

P6 I think the other issue is cultural it's about acceptance of the current workforce to erm embrace this change and erm work with work with us to make sure it's successful

There is often resistance to change, as seen from the participants' comments above. In order to overcome some of these Scott et al. (2003) advocated consideration of ownership, complexity, external influence, leadership, cultural diversity and dysfunctional consequences.

Reactions to change can be unpredictable and lead to dysfunctional consequences as they often promote feelings of loss and stress (Kerber & Buono 2005; Scott et al., 2003) as demonstrated in some participants' responses.

P13 It can sometimes feel like (pause) you're going to have things taken off you perhaps or what am I going to lose

This can lead to disruption and therefore, advocates for the change are essential to gain ownership (Scott et al., 2003). Participants suggested influential sonographers in the department taking a lead on the change

P4 and I think it would help maybe to go through some national ultrasound forums like BMUS or something like that to gain, to gain exposure and also erm higher level kind of acceptance and support from leading sonographers to try and overcome some of the local resistance we might find

P10 you influence your most influential group of people in your department erm and you let people engage with the process in as far as you actually can

Others suggested the professional body for example, to gain acceptance but also to provide the needed effective leadership.

P1 it's something that would be some sort of national, through the College of Radiographers

P2 erm (pause) I think all, whether its employers, professional bodies or regulatory should all work together to try and sort of resolve erm again to remove any barriers to employment

P7 *I think that it'll only be resolved if, if, so, so if they brought in someone like HEE*

This would promote and inspire a shared vision to embrace change relating to new training through transformational leadership (Kouzes & Posner, 1993; Northouse, 2015) where more senior staff influenced junior staff's behaviour (Strudwick, Mackay & Hicks, 2012).

If not leading the change, any professional or regulatory body still needs to be consulted as they often have requirements which could present competing demands (Allen, 2016; Scott et al., 2003). Participants highlighted the complexities associated with there being a diverse range of stakeholders (cultural diversity) that could potentially be affected by the change

P6 I suppose also the fact that it's not just one profession that delivers sonography we're coming at it from all different professions, so I'm obviously talking a lot about radiographers because that's my background but you've got the Medical Physics, you've got the vascular, you've got the midwives we'd all be coming at it from a different view so I think that's, it's complex

P7 HEE are just discovering just how complex this really is where the tentacles go and just how difficult it is to cut away through er it's incredibly complex by the time you bring in all the professions the way that ultrasound education evolved and the regulation aspects as as well

All the multiple professional sub groups must also be consulted (Allen, 2016), for example, in ultrasound, radiographers, sonographers, nurses, midwives and doctors.

This diverse group of contributors can create challenges in ensuring the implementation plan for change is as uncomplicated as possible to facilitate transparency and ownership. To try and facilitate this clear communication strategies are paramount. Participants (P4, P8, P9, P10, P11, P12 and P13) stressed the importance of communication and consultation in implementing change and keeping all concerned informed. All agreed the key to success was

involving the existing workforce and ensuring the value of the change was understood and accepted.

P8 all the parties that are involved they need to be kept well informed if you're changing anything

P9 when I've changed anything, I've had to have them with me, they really have to have a good understanding of what it is and where we're going

P11 I think the biggest, biggest thing is, things, new systems are only successful if everybody that's involved is on board and has a vested interest

P13 erm for any change I think you need to have good communication, with your team

P13 erm the news may not always be welcomed by them but if they have a good understanding of why it needs to happen, what needs to happen, a time frame for it to happen in as well erm I prefer that because then hopefully they will go with you rather than having to be, be dragged along

Allen (2016) advocated a three step approach for effective change which involved preparation, implementation and evaluation. This was aligned to the earlier work of Lewin (cited in Allen, 2016) who termed the stages freezing, changing and refreezing. Detailed planning must precede any implementation of change to assess the current situation and establish support. Kettinger, Teng and & Guha (cited in Allen, 2016) suggested this could be achieved through situational analysis which raised awareness of the issue. The change must be accepted and evaluated following change implementation to ensure success (Allen, 2016; Lewin, cited in Allen, 2016). P10 summed this three stage approach up in their statement

P10 so, the process you need to explore the reason for change, the need for change, communicate the needs for change, speak to individuals, decide on how you're going to implement the change get people to help and support with the implementation process and then afterwards monitor before and after and feedback after how, how that change developed

4.6 Conclusions

Following the Grounded Theory ethos, the three categories and associated sub categories have been explored to demonstrate their individual and distinct qualities whilst also having some element of interlinking. These relationships

are brought together by the overarching core category of *striving for professional identity*. This exploration has raised the question as to whether sonography has a professional identity and therefore whether sonography is a profession or a semi-profession? The lack of professional and social identity was compounded by band 7 sonographers claiming they were operating at advanced practitioner level. Clearly, some sonographers were, however many others did not meet the specified requirements for advanced practice as outlined by the DoH (2000) and SCoR (Coleman, 2013; Freeman, 2010; Milner & Snaith, 2017). The following tables summarise the requirements of advanced practice in relation to sonography (table 9) and the requirements for professionalisation in relation to sonography (table 10) as identified in published literature, participant responses and discussed theory.

Advanced practice requirements	**Evidence for sonography**
Expert practice	
• Reporting in your specialist area,	Reporting of ultrasound examinations (P6, P7, P11, P12).
• running treatment review clinics,	No evidence.
• technique/technology review and implementation.	No evidence.
Professional leadership and consultancy	Limited input at MDT meetings Chief Allied Health Professions Officer's team, 2017; Milner & Snaith, 2017).
• Being asked for your insight and opinion by external/internal organisations/colleagues,	
• being a key contact for other health care professionals in relation to your practice.	Lack of opportunities for band 7 sonographers to extend practice (P4, P6). Opportunities for specialist sonographers (P9, P10).
• Leading elements of service innovation.	Limited leadership roles (Harris & Paterson, 2016).
Education, training and development	
• Delivering expert lectures at a university/hospital.	No evidence.
• Lectures to post graduate students could perhaps be included.	No evidence.
	Participants spoke of mentoring

• Taking an active role in the education and learning of others, must be more than just mentoring students.	(P6, P10).
Practice and service development, research and evaluation • Leading (or leading aspects of) practice and/or service developments for the benefit of service users and/or colleagues and being involved in the evaluation of those developments. • This could include service audit. • Starting your publishing career • You should also be engaged in research and/or audit in some way. You may not be leading the research but you should be playing a significant part in it.	P10 spoke of audit activity of specialist sonographers. Evidence suggested lack of research activity research activity (Probst et al., 2015; Snaith, Harris & Harris, 2016).

Table 9 Evidence for advanced practice associated with sonography.

Requirements to achieve professionalisation	**Evidence for sonography**
Having a well defined skills base underpinned by knowledge (Downie, 1990) and subject to regulatory and professional controls (Clarke & Snowden, 2009).	Scope of practice for sonographers from UKAS, BMUS, SCoR. None are regulatory bodies for sonographers
Being educated rather than being trained with underpinning research (Downie, 1990; Giddens, 2010; Hogg, Hogg & Bentley, 2007).	Postgraduate education as entry level (CASE, n.d.). Limited research activity (Probst et al., 2015; Snaith, Harris & Harris, 2016).
Having a code of practice, professional and regulatory bodies (Downie, 1990; Gibbs, 2013; Giddens, 2010).	No formal code of conduct, professional or regulatory body (P2, P7).
Being autonomous, accountable and freedom to act	Included in the current job description for reporting sonographers (NHS Employers, 2006, p. 8).

Table 10 to illustrate how sonography matches against the criteria for professionalisation.

From the tables 9 and 10, it is evident there was heavy reliance on the reporting aspect of the role to justify sonography meeting the requirements for professionalism and advanced practice.

It is a concern that (at the time of writing) only two band 7 sonographers nationally have formal recognition through accreditation for advanced practice (L.Coleman, personal communication, 2017) and only small numbers enrol each year to gain a full Masters level qualification. The latest figures available from CASE (2016) demonstrated a perturbing reduction in the number of dissertation student enrolments (n= 59); 58% decrease in 2014-15 compared to 2013-14 (n= 101). The number of completions remained a concern with only 61% (n= 36) of students enrolled completing the full Masters qualification. This suggested the number of research active sonographers was relatively low although it is acknowledged there was no register of the actual numbers of sonographers who held a Masters or Doctoral level qualification. The above figures only show the number of sonographers undertaking a CASE accredited ultrasound Masters; others may choose a management or wider imaging award and therefore would not be represented in the figures above. Formal regulation/registration would allow a more accurate representation to be documented.

4.6.1 The mythology of the sonography profession

The notion of sonography being a semi-profession, or even a myth, in terms of the lack of recognition and identity, is a major concern. The occupational group has emerged through tradition and historical events (Hart & Dixon, 2008; King & Ross, 2004) and participants spoke of historical challenges to professional boundaries (P6, P9 and P11). They also expressed resistance to any proposed changes in tradition, for example to educational routes (P6 and P7) (Parker & Harrison, 2015). A myth is defined in these same terms to explain culture or a social phenomenon (Oxford dictionary, n.d.; Wikipedia, n.d.); as seen in the examination of sonography by social identity and identity theories. Sonography as a profession is, arguably, a constructed reality from self categorisation and group membership. This creates an 'exaggerated or idealised conception'; the definition of a myth (Oxford dictionary, n.d.). Myths are also typically associated with higher level beings which can be aligned to the feeling of being special for sonographers (P4, P5, P11 and P13). In a myth, the higher level being holding status is often not real and can be compared to the perceived and transient power sonographers currently hold (P4, P5, P11 and P13).

There is no published work making this connection for sonography. A small number of publications were found in relation to nursing which on the whole, were dated. One article described the requirements for professionalisation as similar to those discussed by Downie (cited in Hogg, Hogg & Bentley, 2007) and concluded each nurse must answer the question themselves as to whether they are a professional or a myth (Straub, 1967). This decision, Straub (1967) claimed, was reliant on each person's own criteria as not all nurses operated at the same level to achieve the requirements for a professional. Sonographers must do the same and if the answer is they are professional, they must work collaboratively to dispel the myths and promote the specialist and advanced roles; something Meier (1999) called for nurses to do.

It was evident from the data and emergent theory that one must question if the crisis the participants referred to was actually a workforce deficit crisis or an identity crisis.

5 Chapter five - Reflectivity and reflexivity

The terms reflectivity and reflexivity are often interchanged and it is important they are clearly defined. Reflectivity refers to the thinking we undertake on our actions and this can be described in terms of in action or on action as defined by Schon (1995) and discussed in the findings and discussion chapter. This type of reflection can promote learning when undertaken in a critical manner by drawing on our prior knowledge and critical judgement skills (Thompson & Pascal, 2012).

Reflexivity allows us to ensure reflection is undertaken critically, by looking back at ourselves through self analysis. This ensures our professional knowledge base is used, the resultant actions are consistent with the knowledge and learning occurs (Thompson & Pascal, 2012). Therefore, reflexivity was used to acknowledge and scrutinise the individuality of the researcher (and their role within it, (Thompson & Pascal, 2012)) with their own experience, background and knowledge in order to give credibility to the research (Giles et al., 2013). Corbin & Strauss (2008) considered reflexivity as an essential and integral part of the Grounded Theory research process which Charmaz (2006) concurred with.

It is recognised that this self analysis can be complex and is integral to many aspects of professional practice including research and leadership (Goleman, Boyatzis & McKee, 2002). Self awareness (along with self confidence, control, integrity and commitment) has been defined as a person's emotional intelligence and is essential to understand other people's emotions and manage relationships (Goleman, 1998b; Goleman et al., 2002). The author was mindful of undertaking self analysis in order to understand and effectively communicate with participants and manage the interviewer/interviewee relationship. However, Cutcliffe (2003) warned that being self aware (which reflexivity relied on) can only be partial. The following is an extract from the reflexive diary demonstrating self analysis in managing interviewer/interviewee relationships.

13th July 2015 - attended a local HEE meeting to discuss the future of ultrasound education. Two other attendees were participants I had already arranged to interview.

Felt unable to fully give my perceptions/opinions in case this may influence the answers they give when I interview them as they would be more aware of my viewpoint.

It is accepted that the interviewer's role in the process could potentially have introduced predisposition as the author was a sonographer, current ultrasound course leader and professional lead for diagnostic imaging, including ultrasound, at the University giving 'insider status' (Braun & Clarke, 2013). This insider status must be considered when the researcher is also a practitioner in the field (McGhee et al., 2007). The ultrasound portfolio is well established with an excellent national reputation. The author was mindful not to influence the respondents in any way. The author also still practised clinically as a sonographer and this added a further level of complexity as the interviewer could have been perceived in this additional role by the participants. Therefore, careful consideration was given to what clothes were worn to the interviews, for example, so as not to portray any particular role or prompt any perceptions of hierarchical positions.

To try and alleviate the challenges potentially posed, it was important the author checked the participants had read the participant information sheet, including the short biography. The author's role as a researcher and University student during the interview was reiterated. In one interview the researcher was possibly seen primarily in their sonographer role as the participant commented

P6 you see people call us nurse don't they? they call you nurse, they don't know what to call you

In another interview it was evident that the participant viewed the researcher in their role as a member of University staff and made several references to course development for example,

P8 again I think erm some life experience to some degree er has something to do with that also the University plays a part in er what's expected of candidates, er sorry can you just repeat that

P8 I think any change needs to be well supported whether it be at University or on a clinical basis er for it to be successful

TS can you think of any other people or bodies that perhaps should provide leadership for sonography?

(pause)

P8 perhaps there could be some sort of University course, that would, a leadership course, I'm not aware that there is any leadership course for er ultrasound so perhaps something like that that might help

Details were recorded in the field notes as suggested by Paradis and Sutkin (2017) relating to this interview which raised the possibility of participant reactivity. The following is an extract from the field notes.

- *Answers felt very superficial*
- *Very difficult to obtain any depth of answers. Almost stock answers*
- *Interview was very brief*
- *Felt they were trying to say what I wanted to hear, e.g. relation back to education*
- *Gained very little*
- *? a little disinterested*

Participant reactivity was defined as an effect during research that leads to behavioural changes to align with 'perceived social norms' (Paradis & Sutkin, 2017). The term was advocated by Paradis and Sutkin (2017) in preference to the phrase the 'Hawthorne effect' which they claimed had lost some of its popularity more recently. The Hawthorne effect was first observed in the 1920's and 1930's in the Hawthorne Works Factory in Illinois and later aligned to productivity by Landsberger (Fernald, Coombs, DeAlleaume, West & Parnes, 2012). In the research field it has been used to describe how participants (or those being observed) modify their behaviour when they are being watched (Fernald et al., 2012; Paradis & Sutkin, 2017). This can create methodological challenges (Boet, Sharma, Goldman, & Reeves, 2012) as participants act differently to how they would do, if not being observed (or interviewed) (Ng & White, 2005). In an attempt to minimise participant reactivity, it is essential a good rapport is established with the participants and any effects documented (Paradis & Sutkin, 2017) whilst acknowledging that researcher influence cannot be completely avoided (Adler & Adler, 1994).

Throughout the research reflexivity therefore was a major consideration and has been described as the central tenet for trustworthiness criteria in qualitative research (Brever, Mruck & Wolff-Michael, cited in Murphy & Yielder, 2010; Cutcliffe, 2000) as any potential influence is documented through constant comparisons through reflexivity (Neil, 2006). It is essential to limit the researcher's effect of prior knowledge on the data (McGhee et al., 2007) to help minimise researcher perspective (Hallberg, 2010; Harris, 2015) through theoretical sensitivity; however, Giles et al. (2013) and McGhee et al. (2007) highlighted that Glaser (2001, p. 47) warned against reflexivity as potentially able to cause 'reflexivity paralysis' by stifling creativity.

Considering the Grounded Theory principles of exploring the deeper meaning to generate theory, comparisons can be made to Thompson and Thompson's (2008) notion of depth to critical thinking. This involved going beyond what was said on the surface by participants and looking for deeper thoughts, feelings and values. It allowed questioning through memo writing. This depth combined with breadth of critical thinking to consider sociological aspects such as power and hierarchy (Thompson & Thompson, 2008) allowed critical evaluation of the perceptions to aid theory development. The following is an extract from an early memo demonstrating depth of critical thinking as the author attempted to go beyond what was being said at face value and find deeper meaning.

Throughout the interview there seems to be a focus on Obstetrics. This is the area that the participant has just trained in and I wonder if this has biased their responses. Is it important to reveal they have just undertaken an ultrasound course?? Are people more 'precious'/biased towards their own area of expertise? I need to remain mindful of this in future interviews and highlight any similarities of particular areas of focus reflecting areas of expertise. Need to go back and perhaps look for this in the previous 2 interviews - constant comparisons. Is there any literature to support this?

A second example demonstrated the depth of critical thinking.

21st May 2016 - generalist V specialist. Is this linked to educational level? Is it linked to seeing possibilities? Would this affect professional boundaries, professional identity, being special? Review SCoR document re: generalist and specialist.

Is it the same as the situation now? With band 7 sonographers performing lots of clinical areas being generalists and those who focus on one clinical (e.g. Consultant Sonographers or nurse sonographers) area being specialists? Would the generalist be any less qualified?? Or more qualified due to wider range?? What is specialist?? What makes them special?

The reflexive diary also incorporated epistemological reflection which is defined as how the researcher reflects on their assumptions about the world and the nature of knowledge (Gray, 2014). The author's background of diagnostic radiography is traditionally underpinned by scientific and positivist research and indeed previous research activity had centred around quantitative methodology. The transition to qualitative methodology was seen as liberating but was also approached with trepidation which is evident in the reflexive diary extract below.

6th August 2015 - nervous about the interviews. What if I don't get the information I need? What information do I need?? Is it because I don't fully know or is it because I won't know because it's GT??

Constant questions around the 'rigour' of the methodology were presented in the early stages and the flexible approach prompted apprehension. Ward, Hoare and Gott (2015) compared this transition from positivism to constructivism to Grounded Theory's evolution from Glaser, Strauss and Charmaz.

Gray (2014) identified a second form of reflexivity; personal reflexivity to document any change in the researcher's attitudes and beliefs and how these could have potentially shaped the research (Gray, 2014; McGhee et al., 2007; Roulston, 2010).

The two schools of thought within Grounded Theory methodology relating to when and how detailed the literature review should be created uncertainty for the novice researcher. Detailed notes were kept identifying the different processes. The importance of this key initial step was overwhelming and the author reflected on questions such as 'what if I do this stage wrong, the whole process could be flawed'. Additional advice was sought from the University's learning centre, Information Specialist for Health and Wellbeing and the Faculty's Information Scientist in the Centre for Health and Social Care Research. This reluctance to start a task had been previously identified during

the early stages of this Doctorate journey as learning theories around intelligence were explored. There were also entries within the reflective and reflexive diary related to despair, confusion and fear of failure. Dweck's (2000) theory of fixed and malleable intelligences prompted questions around learned helplessness and reluctance to start a task which was perceived as too hard (Peterson, Maier & Seligman 1995). The fear of failure was great but not as great as the motivation to succeed demonstrated in the extract below from the critical reflective module.

My personal motivation to succeed in undertaking my doctorate is strong and I constantly battle with the dichotomy of 'learned helplessness' and determination to achieve. This is something I identified with earlier in my doctorate journey as I undertook module 1 and reflected on 'my sheer grit and determination to succeed' in undertaking the 'top-up' degree for radiography, attending evening classes two nights a week. I am also extremely fortunate to have a strong and supportive family network offering additional motivation for me to succeed. My husband has given constant encouragement and support and brought me back to reality when I was in total 'meltdown' and fear of not being able to continue. My mum, in particular, is a very strong woman and continually encourages me to achieve my full potential, reassuring me that I can 'do it'. Parental encouragement is recognised by Dweck (2000) as having a significant impact on a child's learning, something I am eternally grateful for.

Whilst I considered myself as a natural reflector, prior to commencement of this Doctoral programme, I do believe the scientific background of diagnostic radiography facilitated my perception of the world as black and white. I reflected on the steep learning curve to become more critical and questioning in my thinking as demonstrated in the extract from an early module assessment.

This has been a period of significant learning for me as I have had to develop as a reflective practitioner and examine concepts differently. It has already been a steep learning curve as I juggle a very demanding career with study again. However, I am enjoying being a student once again and being challenged mentally. I already can identify a change in the way I am examining and questioning and recognise a deeper level of critical thinking and analysis and am relishing the opportunity to develop further.

My thinking has changed; the imaging contrast has been reduced and the world has many more shades of grey than an ultrasound image.

5.1 Summary

In summary, a reflective diary was kept to document the research journey and thoughts and feelings throughout. It was anticipated that this would be a valuable resource for a constructivist Grounded Theory study to demonstrate the reflexive stance of the researcher and how the theory developed (Charmaz, 2012). This also formed a valuable resource for tracking the research process and decisions made.

6 Chapter six - Summary and recommendations

The impetus for this research was the reported increase in sonographer workforce deficits (CfWI, 2012; CfWI, 2017; Thomson, 2014). This was compounded by the majority of the current sonographer workforce originating from a diagnostic radiography professional background; also suffering from workforce shortages (Price, 2017). Ultrasound departments were struggling to meet increasing service demands and agency staff costs were reportedly high (HEEM, 2013). The current educational models, including availability of clinical placements, could not meet the demand for adequately trained and qualified sonographers (Parker & Harrison, 2015). Band 7 practitioners constituted the majority of the sonography workforce with small numbers of consultant sonographers nationally and no defined career structure for this occupational group (Parker & Wolsenhulme, 2012).

This 'crisis' was not new and potential solutions had been discussed and debated for many years. It was well established that change was urgently needed but there remained lack of clarity of what this change should be and how it could be achieved. One potential solution was a direct entry sonography undergraduate course and this initial study set out to explore the benefits and challenges of employing a new sonographer graduate.

In order to gain and explore the perceptions of key stakeholders related to this, a Grounded Theory methodology was utilised. This allowed rich, in-depth data to be collected. The initial literature review was conducted to set the context for the research and there were three main areas for exploration; education, employment and safe practice. These had formed the basis for the historical debates and publication of findings and personal opinion found in the literature. The main issues identified related to placement capacity, educational level, regulation and scope of practice. These findings, along with theoretical sensitivity, allowed the development of the initial interview schedule.

As the research developed and theory emerged, it became evident that the potential challenges of introducing a new educational model, and integration of the subsequent graduates into the department, were much more deeply rooted.

There was much discussion from the participants around the lack of clarity of roles, skills and career structure which reaffirmed the published literature. There was also a distinct trait of protectionism and resistance to change and an overarching theory emerged around professional identity and professionalisation. Exploration of the associated theory raised questions as to whether sonography currently held the requirements for professionalisation, and indeed whether those performing it, had a professional identity. The evidence relating to what constituted a professional was seated in identity and social identity theories. This brought sonography into question as a speciality, as this research suggested that it lacked many of the requirements of a profession and the professional identity of sonographers was weak. This is perhaps not surprising considering that there has been no prior in depth analysis of sonography as a profession in relation to social identity and identity theories. This research therefore provides valuable insight into the issues faced by this occupational group and offers recommendations for sonography to achieve professionalisation and establish a clear professional identity.

There is a need to promote sonography and increase recognition by both the public and colleagues. It is acknowledged that this is difficult to do without strong leadership to manage and implement change; this study suggested that this is an area that needs development to move sonography forward towards professionalisation.

The banding and pay emerged as a potential challenge as sonography had no clear career structure with defined roles and responsibilities at each level. The study suggested this will be a requirement to achieve the professional status participants spoke of. Whilst it is acknowledged a career structure for sonography had been discussed previously as part of the HEE project, there were no concrete suggestions as to how this might look or be achieved. This research identified there is a need for a career structure, aligned to the qualifications and meeting certain specifications (skills base and scope of practice) and consideration should be given to the experiences in the international arena (Jasa & Kirkland, 2009).

This research recommends that in the absence of regulation, registration should be sought, separate to SCoR and NMC and free of medical control. Participants gave examples of other occupational groups where this had been achieved. This registerable body should set standards and codes of practice as well as develop disciplinary procedures to alleviate concerns raised by participants. These should all be set by sonographers and led by sonographers, affiliated to self regulation, as in the case of the history of nursing/midwifery.

Educational models need to explore the use of training schools which could alleviate some of the pressures associated with ultrasound training. Further research is required to fully evaluate the use of simulation in all aspects of training (Hynes, 2016).

Some participants raised concerns related to the age and immaturity of potential applicants as well as the lack of experience of patients and the health service. Best practice can be drawn from the recruitment and admissions processes of already well established AHP groups to alleviate the concerns surrounding the immaturity and applicant age. This can be extended to the curriculum development to ensure graduates are prepared for potential high emotionally charged, patient situations. The experience from established programmes such as Radiotherapy and midwifery, for example, should be explored.

Participants spoke of the importance of prior experience of health care and communication with patients which potentially a foundation year would address. Some also spoke of a preceptorship year after the course. This research demonstrated there needs to be consideration for both a foundation year or period of induction to health and social care practice and a preceptorship period after the course. This would overcome the concerns related to the lack of experience and knowledge of the health care setting and allow some integration to services prior to commencement of the programme.

6.1 What this research adds

This research has provided a much needed exploration of the deeper key aspects that underpin the challenges that sonography has faced for many years. It suggested the perceived power of sonographers was superficial and not legitimate power and there were deeper issues related to striving for professional identity and achieving professionalisation.

In order to achieve professional identity and professionalisation, critical reflexive practice of the current position needs to be embraced with an open mind.

> 'We cannot solve a problem by using the same kind of thinking we used when we created them'
>
> (Albert Einstein, n.d.)

Only then can theory be utilised alongside practice to facilitate and transform services (Payne, 1998). Current practice is no longer justified and must be changed. The complexities of the social world and sonographers' part in it, can no longer be used to avoid the exploration of new perspectives and challenges (Thompson & Pascal, 2012). Critical reflective practice must be embraced to establish a firm foundation for change, which it is suggested this research provides.

It is acknowledged there may be no straightforward 'right' answers and consideration must be given to the historical contexts as established people in positional power posts have influence. Both of these may dominate over new alternatives (Thompson & Pascal, 2012). Strong and clear leadership is required to drive agendas and move sonography forwards along the route to professionalisation.

This research demonstrated that if sonography can embrace change with strong leadership to achieve the key aspects for professionalisation, it will pave the way for a professional identity.

6.2 Recommendations for change

In order to achieve professional identity and professionalisation, this research suggested there was a requirement for change.

6.2.1 Direct entry

It is unsustainable for sonography training to rely on applicants from another existing occupational group. This creates deficits in the feeder workforce, increased costs and extended periods of time for sonography training to be completed. A direct entry route into ultrasound is well overdue. This research demonstrated that the current situation also created discourse for establishing a clear professional identity for sonography as sonographers are either registered as a different occupational group or not at all.

6.2.2 Education

A new educational model needs to be developed which includes consideration for entry requirements of applicants, preceptorship and clinical placement capacity. A robust recruitment strategy is essential and experience can be utilised from existing professional programmes. Consideration must be given to alternative ways of supplementing clinical experience through the increased use of simulation. Whilst one participant advocated the implementation of formal training schools, further research is required to assess the feasibility of this. This research also suggested it was essential the educational model leads to a clear scope of practice for graduates to facilitate employment. This must be underpinned by research. This would promote professionalism and also contribute to the establishment of a defined career structure for sonography.

6.2.3 Career structure

This research proposed a career structure, aligned to pay, qualifications and scope of practice, should be developed and implemented for sonography. It also proposed this would alleviate the uncertainties around banding and employment. The implementation of a career structure would also facilitate career progression for the existing workforce as they would benefit from further advancement of their own roles. Research and leadership activities would strengthen the case for professionalisation and, as this research suggested, aid in achieving professional identity for sonographers.

6.2.4 Registration

In the absence of sonography being formally regulated by a regulatory body such as the HCPC, this research suggested that sonography graduates are registered with their own body. It is recommended that such a body is established and led by sonographers and is self regulated. The development of defined codes of conduct, ethics and practice as well as skills base, would facilitate professional identity and professionalism.

6.2.5 Leadership

This research highlighted that whilst sonography had small local pockets of excellent leadership, there is a distinct lack on a national level. This also extends to the disappointingly small number of sonographers achieving accreditation for advanced practice. The findings of this study support a claim that establishment of self regulation would improve both of these alongside the implementation of a career structure to promote increased research and leadership activities. This research demonstrates that sonographers need to further embrace and build upon both research and leadership in striving for professional identity.

The research also calls for effective and strong national leadership as essential to manage and implement change.

It is recommended that a multi disciplinary (cultural diversity) leadership team for sonography be established to work in collaboration with key national bodies, including the SCoR, CASE and HEE (providing external influence). This leadership group would be responsible for driving forward the essential recommendations identified above in order for sonography to achieve professionalisation with a clear, strong professional identity. In taking ownership of leading and managing these changes, any untoward and unwanted consequences could be minimised and aspirations for sonography be achieved.

6.3 Summary

This research aimed to gain a deeper understanding of the current perceptions of key stakeholders relating to employing new sonography graduates. The

associated challenges in meeting the workforce deficit in sonography were found to have much deeper and historical origins.

The objective of the research to recommend solutions to overcome the perceived issues of employing the new sonography graduates has been achieved. These were documented in the recommendations section above.

In order to address the issues, the research proposed that sonography must first confront the crisis in achieving professional identity and professionalisation. To facilitate this, it is recommended that further research is conducted in the areas outlined above to ensure transformation of sonography from a myth to a profession.

Word count 45,261 words

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9 Appendices

9.1 Appendix 1 - Search terms

1. CINAHL - search terms

Search number	Search terms	Finds	Comments and decisions made
S1	(MH "Ultrasonography+") OR (MH "Ultrasound Technologists")	55,182	Index terms, the first is exploded.
S2	(MH "Education, Diagnostic Medical Sonography")	90	Index term suggestion in CINAHL, used for education set rather than sono/US set
S3	TI sonograph* OR AB sonograph*	5,755	
S4	TI ultrasound OR AB ultrasound	23,489	Limited to title and abstract as large number of articles found
S5	S1 OR S3 OR S4	69,087	Ultrasound set

Search 1, 3 and 4 were combined using 'OR' to create a 'population' set of similar search terms.

The following search terms were then used to create an 'education' set again using 'OR'.

Search number	Search terms	Finds	Comments and decisions made
S6	(MH "Students, Undergraduate")	2648	Index term
S7	TI ("direct entry" or degree or bsc or undergraduate*) OR AB ("direct entry" or degree or bsc or undergraduate*)	48,554	
S8	TI education OR AB education	146,598	

S9	S2 OR S6 OR S7 OR S8	188,204	Education set

The two sets were then combined using 'AND'

Search number	Search terms	Finds	Comments and decisions made
S10	S5 AND S9	1581	Combined sets. Manually review at title and then at abstract, to exclude all clinically focused papers and duplicates. Results focusing on medical education were also excluded
S11	TI employ* OR AB employ*	61,545	
S12	S5 AND S11	320	Combined employability and sonography set.
S13	TI workforce OR AB workforce	10,216	
S14	S5 AND S13	12	Sonography set and workforce

S10 was re run with title or abstract and 0 results were found. The finds from S10 were manually reviewed at title.

2. MEDLINE - search terms

Search number	Search terms	Finds	Comments and decisions made
S15	TI (MH "Ultrasonography+") OR (MH "Ultrasound Technologists")) OR AB (MH "Ultrasonography+") OR (MH "Ultrasound Technologists"))	256,340	This is the same search as S7 but in Medline. Also MeSH (index word) checked for sonograph, ultrasonograph and undergraduate. No

			new terms identified for first two, undergraduate showed 'education, medical, undergraduate' but definition was for medical school in the USA leading to M.D. qualification, so not used.
Search number	**Search terms**	**Finds**	**Comments and decisions made**
S16	TI (MH "Education, Diagnostic Medical Sonography") OR AB (MH "Education, Diagnostic Medical Sonography")	0	
S17	TI sonograph* OR AB sonograph*	44,918	
S18	TI ultrasound OR AB ultrasound	166,092	
S19	S15 OR S17 OR S18	374,146	Ultrasound set
S20	TI (("direct entry" or degree or bsc or undergraduate*) OR AB (("direct entry" or degree or bsc or undergraduate*)	456,133	
S21	TI education OR AB education	298,648	
S22	S16 OR S20 OR S21	738,435	Education set
S23	S19 AND S22	12,863	Combined education and sonography set
S24	TI employ* OR AB employ*	400,504	
S25	S19 AND S24	5,121	Sonographer and employability/employment combined
S26	TI workforce OR AB workforce	13,340	
S27	S19 AND S26	12	Sonographer and workforce combined
S28	S19 AND S24	4,277	Same as S25 but Limiters - English Language

Further exclusion criteria were then applied using the major subject headings and Journal titles to exclude any clinical focused finds and those relating to medical education, biomechanical and biochemical subjects. It was found that

most of these papers had picked up the word 'employ' in the abstract as a general term and very few were relevant.

3. British Education Index - search terms

Search Number	Search terms	Finds	Comments and decisions made Last Run Via
S1	TI ultrasound OR AB ultrasound	14	
S2	TI ultrasono* OR AB ultrasono*	2	
S3	TI sonograph* OR AB sonograph*	0	
S4	S1 OR S2 OR S3	15	Ultrasound set
S5	TI ("direct entry" or degree or bsc or undergraduate*) OR AB ("direct entry" or degree or bsc or undergraduate*) OR AB ("direct entry" or degree or bsc or undergraduate*) OR AB ("direct entry" or degree or bsc or undergraduate*)	4,714	
S6	TI education OR AB education	51,858	
S7	(TI education OR AB education) AND (S5 OR S6)	51,858	Education set
S8	S4 AND S7	2	Combined sets
S9	TI employ* OR AB employ*	3,607	
S10	S4 AND S9	0	Employ* and ultrasound set
S11	TI workforce OR AB workforce	371	
S12	S4 AND S11	0	Workforce and ultrasound set

4. Scopus - search terms

Search number	Search terms	Finds	Comments and decisions made
1.	(ABS (sonograph*) OR TITLE (sonograph*)) AND (LIMIT TO (LANGUAGE , "English"))	40,835	
2.	(ABS (ultrasonograph*) OR TITLE (ultrasonograph*)) AND (LIMIT-TO (LANGUAGE , "English"))	74,654	
3.	(ABS (ultrasound) OR TITLE (ultrasound))	236,298	Not used as superseded by result 6
4.	(ABS (ultrasound) OR TITLE (ultra sound)) AND (LIMIT TO (LANGUAGE , "English"))	197,215	
5.	((ABS (sonograph*) OR TITLE (sonograph*))) OR ((ABS (ultraso nograph*)OR TITLE (ultrasonograph*))) OR ((ABS (ultrasound) OR TIT LE (ultrasound))) AND (LIMIT -TO (LANGUAGE , "English"))	280,543	results 2, 4 and 6 combined with 'OR' for 'ultrasound' set
6.	TITLE-ABS KEY (education OR bsc OR degree OR undergraduate* OR "direct entry")	2,801,806	
7.	((TITLE-ABS-KEY (sonograph*)) OR (TITLE-ABS-KEY (ultrasonograph*)) OR (TITLE-ABS-KEY (ultrasound))) AND (TITLE-ABS-KEY (education OR bsc OR degree OR undergraduate* OR "direct entry")) AND (LIMIT-TO (LANGUAGE , "English"))	11,765	Combined sets
8.	(ABS (workforce) OR TITLE (workf orce)) AND (LIMIT-TO (LANGUAGE , "English"))	34,391	
9.	((TITLE-ABS-KEY (sonograph*)) OR (TITLE-ABS-KEY (ultrasonograph*)) OR (TITLE-ABS-KEY (ultrasound))) AND (TITLE-ABS-KEY (workforce)) AND (LIMIT-TO (LANGUAGE , "English"))	23	Workforce and sonography set combined
10.	(TITLE (employ*) OR ABS (employ *))	1,450,035	
11.	((TITLE (employ*) OR ABS (employ*))) AND ((TITLE-ABS-KEY (sonograph*)) OR (TITLE-ABS-KEY (ultrasonograph*)) OR (TITLE-ABS-KEY (ultrasound)))	625	Combined sonography set and employability

	AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (SUBJAREA , "HEAL") OR LIMIT-TO (SUBJAREA , "NURS"))		

5. Society and College of Radiographers (SCoR) website.

This is a web based interface for the professional body of radiographers. It does not allow the use of search terms 'AND' and 'OR' and therefore, separate searches were used with relevant terms in the appropriate sections.

5.1. The practice tab was selected and then the ultrasound section. There were 10 sub sections, 7 were explored. The three excluded were deemed not to be of value or contained duplicate material for example, the Register of Sonographers, Musculoskeletal Ultrasound and screening.

- News - the only relevant finds in this section related to policy documents which were duplicates.
- Education and CPD - one website was identified from this section for further analysis 'Sonography' an American based website
- Health and Safety - no relevant documents were found
- Professional issues - this directed to an online document library and a website for NHS employers offering advice on sonography
- registration with basic information and was excluded.
- Ultrasound advisory group - the minutes of the group meeting from 25/11/14 referred to three relevant policy documents which were duplicates.
- Useful links - revealed one relevant website for further review; American Institute of Ultrasound in Medicine (www.aium.org).

5.2. Learning tab

- Policy and guidance document library - a filter was applied with the term 'ultrasound' and 14 results were found. These were reduced to 7

following review at title. Following full review, two were eliminated as they related to health promotion and independent prescribing.

- Radiography Journal - a filter was applied to search for terms in the title, abstract and keyword. Search terms used were 'ultrasound' an 'ultrasonograph' which found only clinically based articles which were not relevant. A further search term 'sonograph' was used with 10 finds which were reviewed at title, eliminating 9 of them.
- Imaging and Therapy Practice Journal -

Search term	Finds	Review at title	Full review
'sonography'	36	0	0
'Undergraduate ultrasound'	10	0	0
'Direct entry'	14	1	0

- Synergy News - 75 finds, with none relevant following review at title.

6. National Institute for Clinical Excellence (NICE)

The following searches and terms were included -

Search term	Number of finds	Number after review at title	Number after full review	Comments
Sonography	3	0		
Sonographer	20	0		
Ultrasound training	62	0		
Ultrasonograph	0			The following two searches were used in case this term did not include the 'er' and 'y' endings
Ultrasonographer	10	5	0	
Ultrasonography	44	1	0	
Ultrasound education	71	0		

A total of 210 results were found initially which were reduced to 6 after review at title and then to none after full review.

7. King's Fund

This is a web based interface and both the publications and library database were searched. The publications section did not allow the use of search terms 'AND' and 'OR' and therefore, separate searches were used with relevant terms in the publications section.

Search terms used were Ultrasound, Ultrasonography, Ultrasonographer, Sonographer, Sonography and no results were found.

The Library Database was then searched with the following terms -

Date	Search	Finds
30/04/2015	ti,wrdl: sonograph* or ti,wrdl: ultrasound or ti,wrdl: ultrasonograph* and ti,wrdl: workforce	0 Not repeated with keyword as all finds from the sonography set already included
30/04/2015	ti,wrdl: sonograph* or ti,wrdl: ultrasound or ti,wrdl: ultrasonograph* and ti,wrdl: employ*	0 Not repeated with keyword as all finds from the sonography set already included
30/04/2015	kw,wrdl: education or kw,wrdl: degree or kw,wrdl: bsc or kw,wrdl: undergraduate* or kw,wrdl: 'direct entry' and kw,wrdl: ultrasound	6 Title review = 1 which was a duplicate
30/04/2015	kw,wrdl: education or kw,wrdl: degree or kw,wrdl: bsc or kw,wrdl: undergraduate* or kw,wrdl: 'direct entry' and kw,wrdl: ultrasonograph*	0
30/04/2015	kw,wrdl: education or kw,wrdl: degree or kw,wrdl: bsc or kw,wrdl: undergraduate* or kw,wrdl: 'direct entry' and kw,wrdl: sonograph*	0
30/04/2015	ti,wrdl: education or ti,wrdl: degree or ti,wrdl: bsc or ti,wrdl: undergraduate* or	0

Date	Search	Finds
	ti,wrdl: 'direct entry' and ti,wrdl: ultrasonograph*	
30/04/2015	ti,wrdl: education or ti,wrdl: degree or ti,wrdl: bsc or ti,wrdl: undergraduate* or ti,wrdl: 'direct entry' and ti,wrdl: sonograph*	0
30/04/2015	ti,wrdl: education or ti,wrdl: degree or ti,wrdl: bsc or ti,wrdl: 'direct entry' or ti,wrdl: undergraduate* and ti,wrdl: ultrasound	0
30/04/2015	ti,wrdl: education or ti,wrdl: undergraduate* or ti,wrdl: 'direct entry' or ti,wrdl: bsc or ti,wrdl: degree and ti,wrdl: ultrasound and ti,wrdl: sonograph* and ti,wrdl: ultrasonograph*	0
30/04/2015	ti,wrdl: education or ti,wrdl: bsc or ti,wrdl: undergraduate* or ti,wrdl: degree or ti,wrdl: 'direct entry'	1528 Education set
30/04/2015	kw,wrdl: sonograph* or kw,wrdl: ultrasonograph* or kw,wrdl: ultrasound	61 title review = 3 but 2 were duplicates
30/04/2015	ti,wrdl: sonograph* or ti,wrdl: ultrasound or ti,wrdl: ultrasonograph*	20 title review = 3

Four results in total were found, 3 were duplicates and the 4th very dated and deemed irrelevant.

8. 'Ultrasound', official journal of the British Medical Ultrasound Society

A manual search was performed of the electronic version of the journal which found one edition focusing on education and training from January 2015, volume 23, number 1 and a small number of additional finds.

The search terms used for this web interface and the finds they yielded are shown below.

Search term	Number of finds	Number after review at title	Number after full review	Comments
Direct entry	21	11	4	
Undergraduate	25	3	2	An additional 3 results were found but these were from 1994 and 1996 and were not available online or via the library services and deemed of limited value due to the age
Employability	2	0		
Employment	36	4	1	3 of the 4 after title review were duplicates

Ultrasound and Sonographer related search terms were not used as this was an ultrasound specific journal and every article would have shown in the results.

9. American Institute of Ultrasound in Medicine

This is a multidisciplinary association of physicians, sonographers, students and scientists who are concerned with advancing safe and effective use of ultrasound through professional and public education, research, developing of guidelines and accreditation. It includes some useful background to the role of the sonographer and a little on education but more detail relating to professional guidelines for each ultrasound examination. It was felt it played a similar role to some of the UK bodies, for example, United Kingdom Association of Sonographers.

Three additional newly published papers were found from additional searches six months after the initial search. These included two Editorial letters and on research paper of survey results. A further search was conducted in CINAHL and Medline a further twelve months later which yielded no new material.

Rerun of CINAHL and Medline searchers, no new finds. 13/01/17

	Query	Limiters/Expanders	Last Run Via	Finds	Action
S10	AB employ* AND AB sonograph*	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	55	Edit S10
S9	TI employ* AND TI sonograph*	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	10	Edit S9
S8	AB employ* AND AB sonograph*	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	559 Mainly clinical papers	Edit

Explanation of search terms used: ti = title field; ab = abstract field; af = author affiliation; / = MeSH; asterisk (*) denotes any character; "" = phrase search

9.2 Appendix 2 - Example of literature search matrix and screening process

Author and date	Refworks ID	Title	Type of paper	Country of Origin	Setting/ notes	Usefulness	Focus	Method
Thomson, Nigel; Paterson, Audrey 2014	613 refworks ultrasound	Sonographer registration in the United Kingdom – a review of the current situation	Journal article Ultrasound Volume 22 Issue 1 Start Page 52	UK	From RCR and SCoR document above	Includes registration and regulations, differences between professional and regulatory bodies, professional indemnity insurance, voluntary register	Registration Regulation Governance	Grey literature

9.3 Appendix 3 - Example of qualitative assessment

Striving for professional identity in Sonography

What are the perceptions of key stakeholders regarding the employment of new sonography graduates?

Assessment of practice literature

Adapted from Hek et al (2000) and Booth et al, (2012)

	K. Martin **The future of sonographic education Ultrasound. , 2015, Vol.23(4), p.196** **Editorial letter**	**Parker 2015** **Educating the future sonographic workforce: membership survey report from the British Medical Ultrasound Society Ultrasound. , 2015, Vol.23(4), p.231** **Research findings = CASP completed**
Is the topic area relevant to my research question?	Yes. Discussed results of BMUS survey, simulation, WRMSD but briefly	Yes. Results of a survey relating to direct entry and perceived benefits and challenges
Are the claims accurate?	Editorial letter	There are multiple discrepancies with the question wording, no pilot study, poor response rate.
Is the article well written and credible?	Yes	The research was conducted by BMUS council development officer and some bias is evident
Is there evidence of peer review?	N/A	Ultrasound the official journal of BMUS
Where is it published? Relevant?	Ultrasound the official journal of BMUS	As above
Clarity	N/A	Yes
Validity	N/A	Some bias evident, self selecting participants, poor response rate, etc
Transparency	N/A	Yes

Example of CASP assessment

Parker and Harrison 2015 CASP

Screening Questions

1. Was there a clear statement of the aims of the research? YES

HINT: Consider

- What was the goal of the research?
- Why it was thought important?
- Its relevance

2. Is a qualitative methodology appropriate? YES

HINT: Consider

- If the research seeks to interpret or illuminate the actions and /or subjective experiences of research participants
- Is qualitative research the right methodology for addressing the research goal?

Detailed questions

3. Was the research design appropriate to address the aims of the research? YES

However, limited information was gained and could be followed up

HINT: Consider

- If the researcher has justified the research design (e.g. Have they discussed how they decided which method to use?)

4. Was the recruitment strategy appropriate to the aims of the research? NO

The sample was self selecting from a convenience sample of BMUS members and delegates to the ASM. This could have introduced bias as only people with a strong view would respond and would not have included a representative sample of the ultrasound workforce/community.

HINT: Consider

- If the researcher has explained how the participants were selected.

- If they explained why the participants they selected were the most appropriate to provide access to the type of knowledge sought by the study
- If there are any discussions around recruitment (e.g. Why . some people chose not to take part)

5. Was the data collected in a way that addressed the research issue? NO

Bias sample as above

HINT: Consider

- If the setting for data collection was justified
- If it is clear how data were collected (e.g. Focus group, semi-structured interview etc.)
- If the researcher has justified the methods chosen
- If the researcher has made the methods explicit (e.g. For interview method, is there an indication of how interviews were conducted, or did they use a topic guide?)
- If methods were modified during the study. If so, has the researcher explained how and why?
- If the form of data are clear (e.g. Tape recordings, video material, notes etc.)
- If the researcher has discussed saturation of data

6. Has the relationship between researcher and participants been adequately considered? YES

There is no real reflexivity and whilst the author's role is declared the implications/influence of this potentially on respondents was not discussed

HINT: Consider

- If the researcher critically examined their own role, potential bias and influence during formulation of the research questions, data collection, including sample recruitment and choice of location.
- How the researcher responded to events during the study and whether they considered the implications of any changes in the research design.

7. Have ethical issues been taken into consideration? NO

No details given about confidentiality, data storage, etc.

HINT: Consider

- If there are sufficient details of how the research was explained to participants for the reader to assess whether ethical standards were maintained
- If the researcher has discussed issues raised by the study (e.g. Issues around informed consent or confidentiality or how they have handled the effects of the study on the participants during and after the study)
- If approval has been sought from the ethics committee

8. Was the data analysis sufficiently rigorous? NO

No in-depth description of how analysis took place. Limited thematic analysis on a few comments given by participants. No reflexivity, limited potential bias discussed.

HINT: Consider

- If there is an in-depth description of the analysis process
- If thematic analysis is used. If so, is it clear how the categories/themes were derived from the data?
- Whether the researcher explains how the data presented were selected from the original sample to demonstrate the analysis process
- If sufficient data are presented to support the findings
- To what extent contradictory data is taken into account
- Whether the researcher critically examined their own role, potential bias and influence during analysis and selection of data for presentation.

9. Is there a clear statement of findings? YES

HINT: Consider

- If the findings are explicit
- If there is adequate discussion of the evidence both for and against the researcher's arguments.
- If the researcher has discussed the credibility of their findings (e.g. Triangulation, respondent validation, more than one analyst.)

- If the findings are discussed in relation to the original research question.

10. How valuable is the research? YES
Although some bias

HINT: Consider

- If the researcher discusses the contribution the study makes to existing knowledge or understanding (e.g. Do they consider the findings in relation to current practice or policy? Or relevant research-based literature?)
- If they identify new areas where research is necessary
- If the researchers have discussed whether or how the findings can be transferred to other populations or considered other ways the research may be used.

9.4 Appendix 4 - Participant information sheet

Sheffield Hallam University

Information for participants

The new sonography graduate; solutions for employability

Chief investigator	Trudy Sevens
Telephone number	0114 225 2493
Date	

Study Sponsor: Sheffield Hallam University

I am currently employed at Sheffield Hallam University as a Principal lecturer as the Professional Lead for ultrasound and the Postgraduate Ultrasound course leader. I am also a student at the University currently undertaking a Doctorate in Professional Studies. I would like to invite you to take part in my research study. Before you decide I would like you to understand why the research is being done and what it would involve for you. Please ask me if there is anything that is not clear.

I am interested in the future workforce for sonography and my research is about the prospect of employing a new sonography graduate who has undertaken an undergraduate BSc (Hons) degree in ultrasound. I would very much value your contribution.

Participant name:

You will be given a copy of this information sheet to keep

1. What is the purpose of this study?

The purpose of this study is to contribute to a student research project required for completing the Doctorate in Professional Studies.
This study has been designed to explore key stakeholders perspectives regarding the prospect of employing new sonographer graduates who have undertaken a BSc (Hons) course in sonography. It is hoped that by exploring these in depth it will be possible to identify potential insights into employability. This in turn could potentially contribute towards alleviating the current workforce deficit of sonographers.

2. Why have I been invited?

You have been invited as you have been identified as matching the participant profile for the study. It is anticipated your perceptions and views will be valuable to the research.

3. Do I have to take part?

Your decision to take part in this study is voluntary. It is up to you to decide if you want to take part, and you can withdraw from the study at any time, without giving a reason.

4. What will happen to me if I take part?

If you decide to take part you will be asked to sign a consent form, to show that you have heard about the study, and understand what it will involve.

The researcher will arrange a meeting to interview you for between 45 minutes and one-and-a-half hours. This will be at the hospital in which you work, at a time that is convenient to you. It will be in a room identified with the help of appropriate hospital staff which will allow you to speak freely and where you would not be disturbed. The interview will be recorded with your permission, using a digital Dictaphone.

At the end of the interview there will be a chance to talk over any worries or concerns that may have come up from the interview; this will not be recorded.

You will be offered another meeting to talk about the information that the researcher got from your interview, or to answer any queries she has about what you said. This will be up-to-you. The researcher could arrange to send you a summary of information to check, if you would prefer not to meet again.

5. Expenses and payments

You will not be paid for taking part in this study.

6. What are the possible disadvantages and risks of taking part?

You are being asked to give up some of your time to take part in the study.

There should be very few risks to you taking part. The interview will be designed for you to talk about your viewpoint and perceptions. The interview can be terminated at any point if you wish.

7. What are the possible benefits of taking part?

It is hoped that by taking part you will be able to contribute to a research study that might help to shape the future sonography workforce and career structure.

8. What if there is a problem or I want to complain?

If you have any queries or questions please contact: Trudy Sevens
☎ Telephone: 0114 225 2493 or ✉ email: t.j.sevens@shu.ac.uk
c/o Sheffield Hallam University, Faculty of Health and Wellbeing

Alternatively, you can contact my supervisor: Dr Pauline Reeves
p.reeves@shu.ac.uk

If you would rather contact an independent person, speak to Peter Allmark (Chair Faculty Research Ethics Committee)
Telephone: 0114 225 5727 e-mail: p.allmark@shu.ac.uk;

9. Will my taking part in this study be kept confidential?

Only the researcher will know that you have agreed to take part in this study. She will not tell anyone else unless you give your permission.

The interview will be recorded using a digital Dictaphone and then written up word-for-word. The researcher will check that the recording and the written transcript are the same. The Dictaphone will be kept in a locked drawer for a period of one year following completion of the research study. The written transcripts will have all links to you or any other people removed. The transcript will be kept on a password protected computer. Personal details will not be included in the final report or any future publications, so people reading these will not be able to identify you. At the end of the study the written transcripts will be kept securely for as long as they might be useful in future research.

The researcher will ask for your permission to use words that you say in the report. This will help people who read the report to understand how the research relates to what people said in the interviews. There will be no personal details in the quotes.

If you raise an issue of concern in the interview, the researcher will consult her University supervisor about what to do. She will act in accordance with her professional Code of Conduct and that of the University, and as far as possible with your agreement.

The documents relating to the administration of this research, such as the consent form you sign, will be kept in a project file. This is locked away securely in a locked drawer. The folder might be checked by people in authority who want to make sure that researchers are following the correct procedures. These people will not pass on your details to anyone else. The documents will be destroyed three years after the end of the study.

10. What will happen to the results of the research study?

The main outcome of the study is a thesis for the Doctorate in Professional Studies at Sheffield Hallam University. Copies of the thesis are kept for other students and staff to see.

The findings may also be written up in a paper for an academic journal or presentation at a conference.
It is anticipated that the research findings may also be of use for potential future employers, employing a new sonographer graduate.

11. Who is sponsoring the study?

The sponsor of this study is Sheffield Hallam University. The sponsor has the duty to ensure that it runs properly and that it is insured.

12. Who has reviewed this study?

All research based at Sheffield Hallam University is reviewed by the Research Ethics Committee. They check studies to protect your safety, rights, wellbeing and dignity. This Committee is run by Sheffield Hallam University but its members are not connected to this research study. The Research Ethics Committee has reviewed this study and is happy with it.

In addition, the hospital Research and Development/Innovation department is aware of the study and is happy it meets their governance requirements.

13. Further information and contact details

If you have any questions please contact: Trudy Sevens
☎ Telephone: 0114 225 2493 or ✉ email: t.j.sevens@shu.ac.uk
Sheffield Hallam University, Faculty of Health and Wellbeing

Or contact my supervisor: Dr Pauline Reeves
✉ email: p.reeves@shu.ac.uk

I have read this information sheet and discussed it with the researcher.

Signature of Participant:……

Date: ……

9.5 Appendix 5 - RISK ASSESSMENT

Before undertaking data collection, you should assess the health and safety risks associated with your proposed research. Your ethics assessment primarily asks you to consider the wellbeing of your research participants; a risk assessment is your opportunity to consider your own safety and wellbeing. For the most part research in psychology does not pose any major risks to you as researcher (if it does, you should seriously consider whether you should be undertaking that research). However, you should think about any *potential* risks relating to your research (even if they are extremely unlikely), and how you can eliminate/minimise these. Risks may be associated with the research topic, or with the venue where you are collecting the data. Some potential risks might include the following:

- Actual or threatened violence, psychological harm, unwanted sexual advances, etc. from a participant.
- Injury or fatality travelling to/from research venue.
- Allegations that you acted violently/inappropriately (e.g. made sexual advances towards participant; threatened participant, etc).
- Being implicated in illegal activities.
- Psychological distress aroused by a topic with which you have unresolved personal issues.
- Health risks (e.g. illness, disease or injury) associated with a particular venue or with the method

You should remember that *anyone* can be at risk (male or female; black or white; gay or straight). We would like to stress that these risks are extremely unlikely, however, we need to know that you have thought about them in relation to your research. Below are some suggestions for good practice:

- Do not give personal details (e.g. home address or phone number) to participants.
- Think carefully about methods for recruiting participants (e.g. what is the potential for the participant to turn out to be someone other than who they claim to be?)
- Where possible, schedule research activities during the day or early evening.
- Where possible, carry out research in venues where other people are around (e.g. on-campus; at the person's workplace; volunteer organisation's centre; etc)
- Ensure that you can get safely to and from venue (e.g. car is safe to drive; not walking alone; Ensuring that buses/trams/trains run frequently to that location)
- Put details of where you are going into a sealed envelope (to maintain participant confidentiality), and on the outside of the envelope put (1)

expected time of arrival, (2) time you expect to finish, and (3) time you expect to be home. Give this to someone you can trust and are able to contact easily. Call this person before entering this venue; call again when leaving venue; and if not returning to the same household as that person, call to let them know you have arrived home safely. Make sure your contact person is aware that you will be contacting them, and knows what to do if you do not get in touch at these times. (e.g. I leave my mobile phone switched on during the research, and instruct my contact person to call me at the specified times, if I have not called first). Ensure that you collect the envelope from them as soon as practicable afterwards. The envelope should only be opened by your contact person in the event of an emergency.

- It is advisable to have a fully charged mobile phone with you (If this is a prepay mobile, ensure that there is plenty of credit on it). If you do not have one, consider borrowing one. If for any reason this is not possible, consider taking someone with you (even if they sit outside in the car for the duration).
- If you arrive at a research venue (e.g. a person's home) and you feel unsafe, or if your safety or wellbeing is threatened/undermined at any point during the research, you should feel free to discontinue the research on that occasion.

Further information about ensuring personal safety can be found at the website for the Suzy Lamplugh Trust (http://www.suzylamplugh.org.uk/).

SECTION C: RISK ASSESSMENT FOR THE RESEARCHER

1. Will the proposed data collection take place on campus?
   If □'Yes' (Please answer questions 4 and 6 only), if 'no' (Please complete all questions)

   Some may take place on the University campus, but the majority will be at the participants' place of work.

2. Where will the data collection take place? (Please list all venues)
   - Sheffield Hallam University, Collegiate campus
   - X Hospital
   - X Hospitals NHS Trust
   - X Hospitals NHS Trust

3. How will you travel to and from the data collection venue?
   Please outline how you will ensure your personal safety when travelling to and from the data collection venue:

Travel by car to venues with advice from informal and formal gatekeepers as to appropriate places for safe parking.

4. How will you ensure your own personal safety whilst at the research venue?

   By following generic rules for safety, having a fully charged mobile phone and an emergency contact who is aware my whereabouts and expected times of arrival at and departure from the venue, and arrival time home.

5. If you are carrying out research off-campus, you must ensure that each time you go out to collect data you ensure that someone you trust knows where you are going (without breaching the confidentiality of your participants), how you are getting there (preferably including your travel route), when you expect to get back, and what to do should you not return at the specified time. Please outline here the procedure you propose using to do this.

   Please see above. The emergency contact person will also be the transcriber so will be aware of the venue as they anonymise the transcripts. They are fully aware of the issues surrounding confidentiality as their previous employment related to child protection and have undergone additional briefing.

6. Are there any potential risks to your health and wellbeing associated with either (a) the venue where the research will take place and/or (b) the research topic itself?
   No.

7. Does this research project require a health and safety risk analysis for the procedures to be used?

   If YES please indicate the current status of Health and Safety Risk Assessment.

   No.

I confirm that this research will conform to the principles outlined in the Sheffield Hallam University Research Ethics policy and the British Psychological Society's Code of Ethics.

I confirm that this application is accurate to the best of my knowledge.

Student's signature and date: Trudy Sevens 01/07/2015

Supervisor's signature and date: Pauline J Reeves 3/7/15

9.6 Appendix 6 - Pilot interview schedule with proposed amendments, reflection and action plan.

Pilot interview schedule and reflection including proposed amendments

Interview questions **Interviewer Trudy Sevens**

1. Introductory phase

Introduction - reiterate purpose of the study, length of the interview and that it would be recorded.

2. Opening development

Check understanding of aims and ability to withdraw at any time.
Reaffirmed the purpose of the study, confidentiality and explanation of the sheet I would use as an 'aide memoir' for the questions.
Confirm definition of Ultrasound graduate.

3. Substantive content

The questions devised followed a logical and thematic order.

Question 1
Can you tell me a little about your current role?

And your previous experience of staff recruitment?

Question 2
What are the current pressures impacting on the ultrasound service in your department?

Why do you think/feel that?
Can you tell me a bit more?
How might that impact upon your department?

Change the question to -
Can you tell me about the current pressures impacting on the ultrasound service in your department?

Question 3
Tell me your thoughts on the current career structure for Sonographers

Why do you think/feel that?
Can you tell me a bit more?
How might that impact upon your department?

Include a follow up question from combining question 6 -

Do you think the introduction of a sonographer graduate would impact in any way on the current sonographer role?
In what way?

Question 4
You are aware that there are moves to introduce a new graduate band 5/6 sonographer role in the near future. Can you tell me your thoughts on this please?'

can you tell me why you think that?
What might this role look like?
Why do you think/feel that?
Can you tell me a bit more?
How might that impact upon your department?

Change question to -
Are you aware that there are moves to introduce a new graduate band 5/6 sonographer role in the near future? Can you tell me your thoughts on this please?'

Question 5
This idea has been around for several years; why do you think it has taken so long to come about?
Why do you think/feel that?
Can you tell me a bit more?
How might that impact upon your department?

Question 6
Do you think this would impact in any way on the current sonographer role?
In what way?
Why do you think/feel that?
Can you tell me a bit more?
How might that impact upon your department?
Delete this question and combine it with question 3 as per comments under question 3

Question 7
Do you think there would be benefits in employing a sonography graduate?
Why do you think/feel that?
Can you tell me a bit more?
How might that impact upon your department?

Question 8
Do you think there would be challenges in employing a sonographer graduate?
Why do you think/feel that?

Can you tell me a bit more?
How might that impact upon your department?

Question 9
What role do professional bodies have in employability?
And regulatory bodies?

Why do you think/ feel that?
Can you tell me a bit more?
How might that impact upon your department?

Ask about regulatory body first and then professional body and give examples so there is no confusion.
Can you tell me your thoughts on the role regulatory bodies have in employability, for example, the HCPC?
And professional bodies, for example, SCoR?

4. Closure stage

Pull the content together, summarise, reflect back where appropriate and thank them for their participation

Ask if there is anything they want to add

Reflection

I undertook two pilot interviews with colleagues, one from a sonographer background (pilot interview 1) and one from a radiography services manager background (pilot interview 2). I asked participant 2 to answer from a radiography services manager viewpoint as the questions are aimed at clinical staff and I wanted to gain an insight into whether the questions would be appropriate.

Both interviews took under one hour.

Both interviews were transcribed by me and a second person identified to transcribe the interviews in the project proposal. This would allow a quality mechanism for comparing the accuracy and standardisation of the transcripts.

Observations	Key learning	Action points
I found it really difficult to remain quiet and not steer the answers.	This is something which I need to be mindful of when conducting future interviews to avoid bias.	Be aware of all verbal utterances
I talked really quickly	In places, my pace was very quick which made transcribing more difficult.	Speak slower
I undertook some 'in action' reflection, particularly, during the second pilot interview. This is included in the transcript for my reference.	This allowed me to seek clarity and feedback on specific thoughts at the time and gained valuable feedback on the structure, wording and process.	This has been used to amend the questions
Question 2 - change 'what' to 'tell me about' to encourage more in depth answers rather than perhaps bullet points or a list		Question 2 - change 'what' to 'tell me about' to encourage more in depth answers rather than perhaps bullet points or a list
There was overlap between the answers of questions 3 and 6.		Combine questions 3 and 6
Question 4 assumed all were aware of the moves to introduce a lower band sonographer graduate	Don't make assumptions	Amend question to ask if they are aware and be prepared to give back ground if they aren't
Question 9 caused some confusion in both interviews over the difference between the regulatory and professional bodies.	Don't assume everyone knows the difference between the regulatory and professional bodies.	Reword question 9 to ask about the regulatory body first, since this is what the participants talked about first regardless. Give examples of the regulatory and professional body for clarity.
Transcribing was extremely time consuming and tiring	Do not under estimate the time it will take to transcribe the interviews	Allow enough time in between interviews for transcribing, coding and analysis before the subsequent interviews.

9.7 Appendix 7 - participant background

Participant	Group	Years in post	Radiographer background
1.	RSM	Over 10 years	Yes, 1st career choice
2.	Other	Under 10 years	No
3.	UM	Under 10 years	Yes, 2nd career choice
4.	RSM	Over 10 years	No
5.	CS	Over 10 years	Yes, 1st career choice
6.	UM	Over 10 years	Yes, 1st career choice
7.	Other	Over 10 years	Yes, unknown
8.	UM	Under 10 years	Yes, 2nd career choice
9.	UM	Over 10 years	Yes, 1st career choice
10.	RSM	Under 10 years	Yes, unknown
11.	CS	Over 10 years	Yes, 1st career choice
12.	RSM	Over 10 years	Yes, 1st career choice
13.	RSM	Over 10 years	Yes, 1st career choice

Key

CS Consultant Sonographer

RSM Radiology Services Manager

UM Ultrasound manager

9.8 Appendix 8 - SHUREC1 form

Sheffield Hallam University

RESEARCH ETHICS CHECKLIST (SHUREC1)

This form is designed to help staff and students to complete an ethical scrutiny of proposed research. The SHU Research Ethics Policy should be consulted before completing the form.

Answering the questions below will help you decide whether your research proposal requires ethical review by a Faculty Research Ethics Committee (FREC). In cases of uncertainty, members of the FREC can be approached for advice.

Please note: staff based in University central departments should submit to the University Ethics Committee (SHUREC) for review and advice.

The final responsibility for ensuring that ethical research practices are followed rests with the supervisor for student research and with the principal investigator for staff research projects.

Note that students and staff are responsible for making suitable arrangements for keeping data secure and, if relevant, for keeping the identity of participants anonymous. They are also responsible for following SHU guidelines about data encryption.

The form also enables the University and Faculty to keep a record confirming that research conducted has been subjected to ethical scrutiny.

For student projects, the form may be completed by the student and the supervisor and/or module leader (as applicable). In all cases, it should be counter-signed by the supervisor and/or module leader, and kept as a record showing that ethical scrutiny has occurred. Students should retain a copy for inclusion in their research projects, and staff should keep a copy in the student file.

For staff research, the form should be completed and kept by the principal investigator.

Please note if it may be necessary to conduct a health and safety risk assessment for the proposed research. Further information can be obtained from the Faculty Safety Co-ordinator.

General Details

(Table cells will expand as you type)

Name of principal investigator or student	Trudy Sevens
email address	t.j.sevens@shu.ac.uk
Course or qualification (student)	Doctorate in Professional Studies
Name of supervisor (if applicable)	Pauline Reeves
email address	p.reeves@shu.ac.uk
Title of research proposal	The new sonography graduate; solutions for employability
Brief outline of research to include, rationale & aims (50 words). In addition for research with human, participants, include recruitment method, participant details & proposed methodology (250 words).	The aim of the research is to gain a deeper understanding of the current perceptions of various stakeholders of the perceived issues relating to employing a new sonographer graduate. This will allow themes to be identified and potential solutions and recommendations to be made. The objectives of the research are to - Explore any perceived issues relating to the employability of the new sonographer graduate Recommend solutions for overcoming the perceived issues of employing the new sonographer graduate Human participants may include advanced practice sonographers, Ultrasound Managers, Radiology Services Managers, Health Education England commissioning and strategic workforce lead, Human Resources Manager, NHS Allied Health Professions Lead. They will be recruited by a purposive sampling method initially using a participant profile and then theoretical sampling will be used to identify staff that are likely to offer a diverse range of perceptions and viewpoints. Participants will be recruited until saturation occurs. Detailed participant information sheets will be provided and informed consent will gained with

	participants signing a consent form. Semi structured interviews will be digitally recorded, transcribed, coded and analysed to develop and test theory. The interviews will take place in the participants place of work in a room identified to provide no interruptions and suitable requirements such as layout, quietness and refreshments. The recordings will be kept in a specified folder to anonymise them and the Dictaphone kept in a locked drawer. The recordings will be kept for a period of one year after the completion of the research project. The transcriptions will be kept on a password protected computer for a period of one year following completion of the research project. A site file will also be kept on a password protected computer for a period of three years follwing completion of the research project. The Trusts Research and Development/Innovation departments have been contacted and approval will be sought to ensure compliance with any Governance procedures. All trasncripts will be read to ensure familarisation with the material and accuracy and member checking will be used to confirm the latter. The data will then be coded utilising NVivo and a thematic framework utilised to identify emerging themes which is hoped will inform theory generation.
Will the research be conducted with partners & subcontractors?	**Yes**/**No** No (If **YES**, outline how you will ensure that their ethical policies are consistent with university policy.)

1. Research Involving the NHS or Social Care / Community Care

Question		Yes/No
1.	Does the research involve the NHS or Social Care/Community Care (SC) as defined below? Patients recruited because of their past or present use of the NHS or SC Relatives/carers of patients recruited because of their past or present use of the NHS or SC Access to data, organs or other bodily material of past or present NHS patients Foetal material and IVF involving NHS patients The recently dead in NHS premises Prisoners recruited for health-related research Participants who are unable to provide informed consent due to their incapacity	No
2.	Is this a research project as opposed to service evaluation or audit? *For NHS definitions please see the following website* http://www.nres.nhs.uk/applications/is-your-project-research/	No

If you have answered **YES** to questions **1 & 2** then you **must** seek approval from the NHS or Social Care under their Research Governance schemes.

NHS https://www.myresearchproject.org.uk/Signin.aspx

If you are undertaking Social Care research in Sheffield you will require a favourable ethical review from a Faculty Committee but must use the Sheffield Council form for this. Full details from http://www.sheffield.gov.uk/caresupport/us/research. For other areas contact the relevant social services department directly for advice on procedures.

NB FRECs provide Independent Scientific Review for NHS or SC research and initial scrutiny for ethics applications as required for university sponsorship of the research. Applicants can use the NHS or SC proforma and submit this initially to the FREC.

2. Research with Human Participants

Question		Yes/No
1.	Does the research involve human participants? This includes surveys, questionnaires, observing behaviour etc.	Yes

Question		Yes/No
Note	*If YES, then please answer questions 2 to 10* *If NO, please go to Section 3*	
2.	Will any of the participants be vulnerable? *Note* *'Vulnerable' people include young people under 18, people with learning disabilities, people who may be limited by age or sickness or disability from understanding the research, etc.*	No
3	Are drugs, placebos or other substances (e.g. food substances, vitamins) to be administered to the study participants or will the study involve invasive, intrusive or potentially harmful procedures of any kind?	No
4	Will tissue samples (including blood) be obtained from participants?	No
5	Is pain or more than mild discomfort likely to result from the study?	No
6	Will the study involve prolonged or repetitive testing?	No
7	Is there any reasonable and foreseeable risk of physical or emotional harm to any of the participants? *Note* *Harm may be caused by distressing or intrusive interview questions, uncomfortable procedures involving the participant, invasion of privacy, topics relating to highly personal information, topics relating to illegal activity, etc.*	No
8	Will anyone be taking part without giving their informed consent?	No
9	Is it covert research? *Note* *'Covert research' refers to research that is conducted without the knowledge of participants.*	No
10	Will the research output allow identification of any individual who has not given their express consent to be identified?	No

If you answered **YES only** to question 1, you **must** submit the signed form to the FREC for registration and scrutiny by the Chair. If you have answered **YES** to any of the other questions you are **required** to submit a SHUREC2A (or 2B) to the FREC.

3. Research in Organisations

Question		Yes/No
1	Will the research involve working with/within an organisation (e.g. school, business, charity, museum, government department, international agency, etc)?	Yes
2	If you answered YES to question 1, do you have granted access to conduct the research? *If YES, students please show evidence to your supervisor. PI should retain safely.*	Not yet
3	If you answered NO to question 2, is it because: A. you have not yet asked B. you have asked and not yet received an answer C. you have asked and been refused access.	B
Note	*You will only be able to start the research when you have been granted access.*	

4. Research with Products and Artefacts

Question		Yes/No
1.	Will the research involve working with copyrighted documents, films, broadcasts, photographs, artworks, designs, products, programmes, databases, networks, processes or secure data?	No
2.	If you answered YES to question 1, are the materials you intend to use in the public domain?	
Notes	*'In the public domain' does not mean the same thing as 'publicly accessible'.* *Information which is 'in the public domain' is no longer protected by copyright (i.e. copyright has either expired or been waived) and can be used without permission.* *Information which is 'publicly accessible' (e.g. TV broadcasts, websites, artworks, newspapers) is available for anyone to consult/view. It is still protected by copyright even if there is no copyright notice. In UK law, copyright*	

Question		Yes/No
	protection is automatic and does not require a copyright statement, although it is always good practice to provide one. It is necessary to check the terms and conditions of use to find out exactly how the material may be reused etc. *If you answered YES to question 1, be aware that you may need to consider other ethics codes. For example, when conducting Internet research, consult the code of the Association of Internet Researchers; for educational research, consult the Code of Ethics of the British Educational Research Association.*	
3.	If you answered NO to question 2, do you have explicit permission to use these materials as data? *If YES, please show evidence to your supervisor. PI should retain permission.*	
4.	If you answered NO to question 3, is it because: A. you have not yet asked permission B. you have asked and not yet received and answer C. you have asked and been refused access.	**A/B/C**
Note	*You will only be able to start the research when you have been granted permission to use the specified material.*	

Adherence to SHU policy and procedures

Personal statement	
I can confirm that: I have read the Sheffield Hallam University Research Ethics Policy and Procedures I agree to abide by its principles.	
Student / Researcher/ Principal Investigator (as applicable)	
Name: Trudy Sevens	Date:
Signature:	
Supervisor or other person giving ethical sign-off	

	I can confirm that completion of this form has not identified the need for ethical approval by the FREC or an NHS, Social Care or other external REC. The research will not commence until any approvals required under Sections 3 & 4 have been received.	
	Name: Pauline Reeves	Date:
	Signature:	

9.9 Appendix 9 - participant consent form

Sheffield Hallam University

PARTICIPANT CONSENT FORM

TITLE OF RESEARCH STUDY: The new sonography graduate; solutions for employability

Please sign against each of the following questions to indicate you agree.

	Participant signature
1. I have read the Information Sheet for this study and have had details of the study explained to me.	
2. My questions about the study have been answered to my satisfaction and I understand that I may ask further questions at any point.	
3. I understand that I am free to withdraw from the study within the time limits outlined in the Information Sheet, without giving a reason for my withdrawal or to decline to answer any particular questions in the study without any consequences to my future treatment by the researcher.	
4. I agree to provide information to the researchers under the conditions of confidentiality set out in the Information Sheet.	
5. I wish to participate in the study under the conditions set out in the Information Sheet	
6. I consent to the information collected for the purposes of this research study, once anonymised (so that I cannot be identified), to be used for any other research purposes.	

Participant's Name (Printed) ……..…
Date:……

Contact details:
……..

……
……..

Researcher’s Name (Printed): ……..

Researcher’s Signature: ……..

Researcher's contact details:

(Name, address, contact number of
investigator)……

……..……
…..

Please keep your copy of the consent form and the information sheet together

9.10 Appendix 10 - interview schedule example

Interview schedule July 2015

Interview questions **Interviewer Trudy Sevens**

Title The new sonography graduate; solutions for employability

Research question **What are the perceptions of key stakeholders regarding the employment of new sonography graduates?**

1. Introductory phase

Introduction - reiterate purpose of the study, length of the interview and that it would be recorded.

2. Opening development

Check understanding of aims and ability to withdraw at any time.
Reaffirmed the purpose of the study, confidentiality and explanation of the sheet I would use as an 'aide memoir' for the questions.
Confirm definition of Ultrasound graduate.

3. Substantive content

The questions devised followed a logical and thematic order.

Question 1
Can you tell me a little about your current role?

And your previous experience of staff recruitment?

Question 2
Can you tell me about the any current pressures impacting on the ultrasound service in your department?

Why do you think/feel that?
Can you tell me a bit more?
How might that impact upon your department?

Question 3
Can you tell me your thoughts on the current career structure for Sonographers

Why do you think/feel that?
Can you tell me a bit more?
How might that impact upon your department?

Question 4
Are you aware that there are moves to introduce a new graduate band 5/6 sonographer role in the near future? Can you tell me your thoughts on this please?

Can you tell me why you think that?

What might this role look like?
Why do you think/feel that?
Can you tell me a bit more?
How might that impact upon your department?

Question 5
This idea has been around for several years; why do you think it has taken so long to come about?

Why do you think/feel that?
Can you tell me a bit more?
How might that impact upon your department?

Question 6
Do you think there would be benefits in employing a sonography graduate?

Why do you think/feel that?
Can you tell me a bit more?
How might that impact upon your department?

Question 7
Do you think there would be challenges in employing a sonographer graduate?

Why do you think/feel that?
Can you tell me a bit more?
How might that impact upon your department?

Question 8
If sonographer graduates were to be introduced, what do you think would be the best way to incorporate them into the department?

During training?
Once qualified as employees?

Why do you think/feel that?
Can you tell me a bit more?
How might that impact upon your department?

Question 9
Do you think the introduction of a sonographer graduate would impact in any way on the current sonographer role?

In what way?

Why do you think/feel that?
Can you tell me a bit more?
How might that impact upon your department?

Question 10
Can you tell me your thoughts on the role regulatory bodies have in employability, for example, the HCPC?
And professional bodies, for example, SCoR?

Why do you think/ feel that?
Can you tell me a bit more?
How might that impact upon your department?

Question 11
Do you think you would employ a new sonographer graduate?
Why do you think/ feel that?
Can you tell me a bit more?
How might that impact upon your department?

Question 12
Can you tell me what you think would need to change to facilitate employing a sonographer graduate
Why do you think/ feel that?
Can you tell me a bit more?
How might that impact upon your department?

4. Closure stage

Pull the content together, summarise, reflect back where appropriate and thank them for their participation

Ask if there is anything they want to add

9.11 Appendix 10 - Transcript example.

TS right P6 thank you for agreeing to take part in this interview er just to confirm that you've received the participant information sheet and you understand what the study is about and everything

P6 yes

TS thank you, erm just to reiterate erm that the interview should take between about 30 minutes to an hour at the most and that we're recording it but it will be anonymised and it will be kept confidential

P6 ok

TS erm to reaffirm that you can just withdraw at any time should you wish to and this sheet that I'm using is an aid memoir for me so I don't forget the questions and if, I might write one or two things down if I need to remind myself and I want to come back things later on ok?

P6 ok

TS so, to start with can you tell me a little bit about your current role please?

P6 my current role here is I'm a lead sonographer so I erm I work as a sonographer so I might do scans in abdominal, gynae and obstetrics. I lead the team so I'm responsible for their er development erm and setting standards, monitoring those standards, erm also for managing the service ie delivering the service, making sure erm we stick to targets, 18 week care pathway, 6 week wait, 2 week waits etc. I think that's probably about it

TS ok and your previous experience of staff recruitment

P6 er I've done interviewing whilst I've been in this role so over the last 30 years erm I've interviewed for erm sonographer posts also for another lead sonographer post and imaging assistants and I've also had some input into certain specialised radiography interviews when needed. (2.10)

TS ok thank you, can you tell me about any current pressures impacting on the ultrasound service in your department at the minute

P6 there are many pressures at the moment erm across the service in obstetrics erm the pressures of erm are work, sorry the delivery, the number

of deliveries has gone up, the birth rate has gone up so that means that more scans needed er you have to divert sonographers to provide the two scans, the two routine scans in obstetrics, as you know, the windows for those are quite small erm so you have to provide that first scan by 14 weeks 2 days, you have to provide, this is to meet FASP standards the erm 18 to 20 plus 6 has to be completed by 23 weeks even if they're having a follow up so they're pressures. We have quite a high recall rate for those scans, some of that's due to the increase in BMI, some of it's also caused by the FASP standard and sonographers wanting to achieve that standard erm and wanting, it's raised the bar if you like, but based around needing to almost needing to create the perfect image: erm and then in non obstetrics trying to meet the 6 week erm **target** that we have for imaging erm the increase in demand when they put on erm initiatives in outpatients for example, they may suddenly see an extra 100 patients a week and we have to try and fit them in: and then also from the GPs since the AQP started 3 years ago we've seen a massive increase in GP erm referrals particularly in MSK, for example shoulder referrals from GPs over the last 12 months have doubled; so these are the sorts of the pressures along with erm trying, a big hole in the workforce, a local deficit we're carrying just one whole time erm equivalent vacancy at the moment that we can't recruit to erm we also erm will have another one shortly and I think we'll have the same problem with that, and then the workload, making sure the sonographers are supported in terms of not developing RSI, not being able to just extend the day and squeeze more patients in, because you have to look after staff. (4.37)

TS mm ok thank you so you're aware that currently there's some work being carried out by Health Education England to explore potential solutions to the current workforce deficit of sonographers

P6 yes I am

TS so one of the suggestions that they're exploring is a new graduate band 5 or 6 for sonographers role so can you tell me your thoughts on that please

P6 I think, this is interesting because it's quite complex what I think, I think they've got potential I feel that erm because of the pressures I've talked about the deficit in the workforce erm something's got to happen so we've got to try and find a way of erm making the training of a sonographer, erm not waiting until they've done a degree then another two years, erm it's just too long by the time we've done that we'll have an even bigger hole so I think it's out of necessity that this needs to happen erm I feel that the actual skills required erm for a band 5/6 are not yet clear in my view, I think work needs to be done on exactly what we'd expect this band 5 and band 6 sonographer to look like in terms of of what they would deliver erm I can see certain areas where er it

would probably be easier, I can see things like DVT scanning erm some obstetric screening erm things like that where some early pregnancy perhaps where it would fit quite nicely, whereas the more general abdominal and gynae where you really don't know what you're going to get 'fishing trip' from a GP might be more difficult erm but I think it's doable erm, could you just remind me of the question again (6.25)

TS so what are your thoughts on the band 5/6 sonographer role

P6 yes yes in terms of the state registration, or that's not quite the right term I know, but I'll let you erm I'll let you put that properly, erm I don't see that as a major issue any more, we've had, as far as I'm concerned, the green light from the Society to explore this and I think there are ways around that and we already know that there are sonographers working in local trusts and nationally that aren't HCPC registered or with another regulatory body, so to me that's not a major issue, I think the other issue is cultural it's about acceptance of the current workforce to erm embrace this change and erm work with work with us to make sure it's successful

TS why do you think there's that cultural challenge

P6 I think it's a bit about the professional, erm about them protecting their own work, I think it's a bit about of 'well I had to do an MSc' or 'I had to do a post graduate diploma so why can't they', erm I think it's a bit about erm thinking that younger people, you hear the view that these might be younger people, which they might not necessarily be just because they'e going into an undergraduate they could be a mature student, but the held view that I hear is that well how can an 18 year old do this? (7.54)

P6 so I think if we did accept younger people erm we'd have a little bit of work to do with the current workforce to erm make sure we got their support, so that's the major cultural thing - it's more or less we've always done it this way so erm this new way won't work.

TS mm O.K. so one of the other erm suggestions potentially it's not a pure ultrasound degree it's a combined radiography and ultrasound degree, so there might be some commonality early on in the degree and then they branch into ultrasound. Do you think that would address some of the challenges that we currently face for example, the professional protection and maturity

P6 I'm I'm not sure how to answer that I think it would depend on what what the commonality is that's delivered. What I feel now is the problem is that when people do a radiography degree and then we take them straight onto ultrasound to try and erm bridge the gap if you like, erm they've wasted a lot of

er a lot of what they've done is almost wasted, yes the things about patient care, the things about anatomy, the things about cross sectional imaging would be useful so I suppose if the joint bit covered those things then yes I could see that, I suppose the benefit of that also would be that you'd get the people, they'd be sort of working in departments or at least have an idea of what imaging is all about erm so they've got a broader base, so yes I could see some benefits for that.

TS mm

P6 yes providing the content erm was right. (9.44)

TS ok, so just picking up on that and something you said earlier about there's no national consensus of what the competencies of a band 5/6 might look like, why do you think that is

P6 so why do I think we haven't,

TS yea

P6 I think it's complex, erm I think the problem with ultrasound is, from my perspective is you just don't know what you're going to see when you put the probe on and a lot of people can't see past that so they're scared that if you decided that, let's say for example that a band 5 erm or a newly qualified you know this band 5 sonographer could do erm a haematuria clinic, a kidney clinic erm that they might miss some more subtle pathology or they might find something on a kidney and then not be able to extend it to do the rest of the examination, so it's about, it's about a reluctance that actually you could get these people to know their own limitations, erm and also I just think it's on the too difficult to do pile

TS mm

P6 it's quite it's going to be a time consuming, multi factorial and you need a lot of multi professional, I feel, erm input, I think it's doable but it's really a matter of not keep brushing it aside and sitting down and thrashing it out

TS mm

P6 and I think there's just been a reluctance for anybody to invest that time, I suppose also the fact that it's not just one profession that delivers sonography we're coming at it from all different professions, so I'm obviously talking a lot about radiographers because that's my background

TS mm

P6 but you've got the Medical Physics, you've got the vascular, you've got the midwives we'd all be coming at it from a different view

TS mm

P6 so I think that's, it's complex

TS do you think that's a good thing or a bad thing?

P6 it should be a good thing, it should be a good thing but it's the professional boundaries that prevent that because a lot of a lot of people I see and speak to just can't get past that

TS mm

P6 in the current work force

TS mm

P6 and even me several years ago might have been one of those

TS mm and what's changed, what's changed you (11.59)

P6 what's changed me is that the massive explosion in the applications of erm ultrasound, the massive increase in the demand, and the fact is that the current workforce can't meet it so something has got to change. We can't keep waiting 5 years to deliver a sonographer, who might have done a radiography degree that they're now not using so I'd argue that they've had at least 18 months of wasted erm study, if you like, wasted might not be the right word, but that's what I mean

TS mm

P6 it's not the most appropriate use of their time, so so I feel that's a factor, sorry could you say again

TS erm

P6 about why I've changed?

TS yes what's changed your view point

P6 yes what's changed my view point. So it's about being able to deliver it, it's about erm (pause) I'm sorry I was going to say something else but I've lost my thread I'll come back to that if that's ok

TS ok that's fine. So do you think there are any other under pining educational models that we should be considering (13.14)

P6 (long pause) I'm not sure, erm I'm not sure exactly what to say for that, have you

TS so for erm we've talked about a direct pure ultrasound and possibly joint degree

P6 ok

TS do you think there's anything else that potentially we should be considering to train sonographers or somebody to perform ultrasound examinations

P6 er I know there's been some talk about a direct entry MSc erm but I don't really see that as being particularly different to what we're doing now other than it may er attract erm a wider erm field of people, but we already could do that really; so I think if that was the case we just need to do more marketing to get people on what we're already doing whilst developing the other. But no I think the model of the erm either three or four year er BSc would be my preferred option (14.17)

TS ok (pause) so would, do you think you would employ a new sonographer graduate

P6 yes yes

(pause)

TS why why do you say yes so definitely what makes you

P6 well

TS so sure

P6 well because we're struggling to recruit so much, because we train already, for example we've had two radiographers, newly qualified radiographers, who came to us last year and we've trained them successfully to certificate level, yes alright they've done an undergraduate degree but that

means they're competent within four years of starting that degree and we've only actually had them in ultrasound for less than a year, so what is the difference, and we're having to pay them at erm annex U band 7 but that's mainly due to pressures, you know, from outside and that fact that if we don't pay them that, we'll lose them

TS mm

P6 it, it's not necessarily that they should command that, that's market forces. erm so if you were to take, if say it was a four year with, you know, some commonality to start with and then the ultrasound bit and you've had them in your department for at least, you're going to have had em two, maybe three years then they're surely going to be as good as the ones that we've just done

TS mm

P6 so it's just about thrashing a method out within the trust for how to employ them

TS mm and do you perceive that to be the major, potentially one of the major stumbling blocks

P6 I do, I do

TS for the trust to get on board with the employability

P6 yes and nationally really it's acceptance of us too, we've had you know, I don't think the Society's going to put up a stumbling block, (16.02)

P6 it's about the trust, it's about what, they're not going to be HCPC registered so what are we going to put in place instead, what quality, what quality measures are we going to have? erm they can be developed, but they would have to be in place, for their professionalism, accountability those sorts of things erm and then if if you're, the other threat is, if I'm offering that but somewhere down the road isn't I know where they're going to go so I've got to be careful it's got to be, certainly I'd like to see it as a regional approach.

TS mm what do you think's stopping that at the minute

P6 pause well I don't think we're getting support from erm you know, we're all talking and saying things but nobody's actually making it happen, so I know universities are looking at the options but it would have been nice if somebody like HEEM when we were having the discussions, you know,

actually stuck their neck out and said as a region this is what we're going deliver, I think you would have much more acceptance even of those who weren't quite so keen if we were all going as a region

TS mm

P6 I think people would've been on board with it, so I would've liked to have seen somebody HEEM decide what educational model we were going to develop and do it

TS mm and do you think, whose responsibility is it to make that happen?

P6 (long pause) I don't know, is the answer. I mean I've heard people say the Society should do it, BMUS should do it, we've got to do it from within so you know the profession's got to be accepting but how, I don't know how you could coordinate all the radiology service managers and sonography managers to take it on without something like coming from Health Education England (18.02)

TS mm a National drive?

P6 a National drive yea, people would feel more comfortable that you're not taking on all this training to lose them somewhere else or somebody down the road is doing the same job for a different band

TS mm

P6 so certainly regionally or nationally people would feel more comfortable cos that's the way we go, just like when we changed it to a degree program, we changed it from a DMU to a, or when midwifery went from a, how they changed with their, what was it -something 2000

TS mm

P6 when they changed theirs it was a **national** thing

TS mm ok thank you erm so if a sonographer graduate were to be used, and you've indicated that you would be amenable to employment, what do you think would be the best way to incorporate them into the department?

P6 you see it's a bit chicken and egg. I think it depends on what skills they've developed whilst they were doing their erm degree

TS mm

P6 I certainly wouldn't want them working in isolation

TS mm

P6 so they'd have to be part of a team and I'd want, I'd want them to be, I mean ideally you'd want some sort of structure to your workforce so, if you're bringing in people at the bottom you want to release people to do more things at the top and ideally in in a setting like ours where you've got three or four rooms going you'd just have one of the, er your baby ones, your newly qualified ones in a team

TS yea

P6 with more experience so they could be working with their own lists, I think you'd be looking at, you'd be handpicking to start with the cases that they would do you so might be looking at some GP erm abdominals or gynae or whatever it is

TS mm

P6 or very prescriptive aortas I think you'd be looking at, at what sort of examinations you allowed them to do knowing that there'd be somebody next door who could help them out if they found an unexpected finding (20.05)

P6 what I'd expect from them is not knowing what everything is but knowing their limitations so they'd have a set target of what they're trying to achieve and if they can achieve that and report on it they don't need to be second checked

TS mm

P6 as soon as they can't deliver that norm or that variation that is then when they'd need to get someone else to check it so that's how I'd see them but in actual, but what I'm not crystal clear about is exactly what their scope of practice would be

TS mm

P6 that's where I think the work needs to be done

TS mm yeah and I think that's the million dollar question

P6 mm

TS ok so it'd be about integrating them in to team

P6 yes

TS having that support for advice and expertise

P6 yes

TS and about them being able to be very clear on **their** scope of practice

P6 yes

TS ok thank you, so can you tell me your thoughts on the **current** career structure for sonographers please

P6 I think it's very poor, there isn't one is there really so they're, we've got a load of band 7s a few 8as who will either be managerial or clinical lead erm I think there's a little bit of movement towards more clinical lead now I think that's been recognised

TS mm

P6 very few consultant sonographers so there is no structure really you could be on a band 7 er at the age of 25 erm at the moment even a bit younger than that, erm with no prospect of er any advancement of your er career, so there is none really

TS and why do you think that is?

P6 (long pause) well it's because of the way it was made into a MSc and the fact that er well Masters level erm there's reporting as seen if you're reporting erm it's to do with the Agenda for Change mainly so because independent reporting is seen as a band 7 level, band 7 skill erm they automatically get put on to that band 7 so there's nothing underneath

TS mm (22.12)

P6 so I feel that erm in terms of more higher areas then more consultant sonographers so why hasn't that happened I think that's mainly down to lack of funding and in some instances the erm the consultant radiologists not supporting it and not wanting to let go

TS mm and why do you think that is?

P6 professional, protecting their profession again protecting their own, even though in many circumstances now for example here the radiologist, other than the MSK, if you took the MSK out they deliver less than 10% of the service erm I'm not sure how much support we'd have to develop erm consultant sonographer roles across different erm ultrasound areas

TS mm

P6 it's almost like they're not doing the work but they don't want to give it up

TS mm (pause) mm

P6 and I think in some erm trusts erm that's a very big problem, here we're managing to break down those barriers slowly but I do feel in some trusts especially the older radiologists you know who don't want to let go: as well as the lack of funding and **lack** of support in building er er a good business case

TS with erm I'm just thinking about the radiologists not wanting to let go, there are a lot more consultant radiographers

P6 yea

TS nationally than there are sonographers

P6 yea yea

TS why do you think there is that difference (pause) cos historically we know the sonographers will have lead the way for the reporting really (23.50)

P6 do you think it's erm and I'm not too sure, I'm not sure but is it because erm plain film's not very sexy for radiologists that basically that they're happy to let that go erm, certainly I've heard the view here from one or two that they don't want to be sat, consultants don't want to be sat in their office all day so they do want some patient contact and ultrasound definitely gives them that

TS yea

P6 er so I don't know whether that is a factor it could be erm (pause) I feel disappointed that we haven't got more consultant sonographers in the erm cos the role development in from radiographer to sonographer was as you say was the first and far more of them

TS mm

P6 erm but I suppose a lot of that was in obstetrics and obstetrics is just not valued, certainly not by consultant radiologists

TS mm

P6 it's seen as second rate

TS why do you think that is?

P6 well I think a lack of knowledge in some ways, the fact that a lot of it is screening and measurement, so it's under valued. I think the advanced communication skills erm and some of the complexities when you do find an anomaly are very much erm under valued, er and I do, I suppose in some of the bigger centres you've got feto maternal medicine has grown up and you've got specialist consultants there erm who are also training registrars and medical staff who probably lose sight of the erm sonographer role

TS mm ok thank you. Do erm so we've talked a little about the current career structure erm do you think there are other options for a sonographer career structure?

P6 currently or with development?

TS potentially

P6 (long pause) the only other way I see it going is erm along the care pathways, so not a sonographer persa but you know a midwife sonographer, a physio sonographer, that sort of erm for example we know that some gynae nurses specialists erm who deliver sonography and report their own work are quite happily paid on a band 6 (26.14)

TS mm

P6 erm you know there's advancement there erm they could develop into a band 7 by broadening their scope of practice gynae for example, pathology, erm so I see it there but for us as a job in sonographer there's a little bit of scope for maybe a paediatric erm radiographer doing some neonatal hip scanning erm you know, so of the radiographers who are interested in vascular or cardiac maybe doing DVT scanning, so along those pockets but if you are a job in sonographer and sonography is what you do all the time I think the 5, 6, 7, 8a really is the only thing I can, come up with

TS ok thank you so can can erm if we were going to look at a new a different career structure like you've mentioned the 5, 6, 7, 8, 8a like the traditional four tier structure, what do you think would need to change to facilitate implementing that cos at the minute we've not really got that structure have we

P6 no,

TS what would need to change to facilitate it?

P6 I think the education models we've spoken about so you could look at you know the graduate, the degree level and then obviously the Masters level

TS yea

P6 er you could look for the higher bandings looking at more role development in terms of injections erm, head, FNAs, erm drainage, so taking on more of the traditional radiology for that

TS mm (27.58)

P6 so also more involvement in MDTs, direct liaison with consultants from other specialities so I think the 8a I think there's a lot of scope, research, education so I think that's that's easier erm I think there'll still be a role for the band 7s as now because you don't want to lose that expertise erm maybe there's scope for them being again down more specialist routes because as the number of examinations is growing it's very hard to be at a at a high level across all types I mean there's abdominal, gynae, MSK, vascular, there's all these different, obstetrics there's all that different so I think there's good scope for the band 7s broadening out. What I still struggle with is where does the band 5, the band 5 then coming in they'd be the very junior ones so where where the line between 5 to 6 and 6 to 7 is, is where we need to do more work, I feel it's probably more about the complexity of what we're looking for erm but that's hard to predict from the referral

TS yea

P6 so are you talking about having a first line ultrasound like you, erm you know, we all know when they're admitted to hospital the first thing line investigation is an ultrasound

TS yea

P6 so are they just screening out certain things and then if nothing's turned up on that do they come back for a second line, I'm not sure

TS mm

P6 I'm not sure

TS yea

P6 or do you draw the line where they've had other imaging for example we get CT scans that show something and they want an ultrasound for correlation, well you wouldn't expect your band 5 to do that

TS no

P6 that would be a more senior person so there are some demarcations but without looking down each individual pathway and and indication, I think that's hard

TS mm and very diverse (29.56)

P6 yea but it shouldn't stop us looking at it

TS no erm (pause) ok thank you what so we've talked a little bit about the challenges for implementation what do you think are the benefits for implementation?

P6 I think the benefits, for implementing like a tier, a structure?

TS yea

P6 well I think there's career progression so you know people can come on at a lower level, they can see a career pathway for them in sonography. I think the career development at the upper end is a real plus for those band 7s who are there now and have been doing ultrasound for some time

TS mm

P6 it gives them erm more of a goal, erm it will drive up standards, we can do, we don't do enough audit, erm I feel like we could do more audit, we could erm there is this audit tool that's come from BMUS, I feel that we could look at more of that, we could look at how we could improve and meet those standards, I feel that erm (pause) hopefully we could try and plug this hole in

the workforce and stop this loss er to agency and this reliance on agency erm and er this sort of awful that circle we seem to be on erm to offer that career development

TS mm

P6 it would also give more opportunities rather than the only opportunity being management

TS mm yea mm ok thank you. Change tact a bit now so, can you tell me your thoughts on preceptorship

P6 in terms of erm is this, just remind me, is this something after training they're given a year or

TS a specified time

P6 a set time

TS yea yea (32.0)

P6 (pause) it's not something we use here although we **have** put it in place err we tend to take the view that we look at each individual erm and if preceptorship is needed in some areas we will put that in place, we tend to do it more on a ad hoc basis that, we take the view that because we have been training this individual for some time they have learned to know what their limitations are and when to ask for advice and the door is always open to ask for that advice and then we'll just do a snap shot look at what they're doing and making sure they're up to standard. I can see some benefits of preceptorship erm for a set time period erm in terms of maybe having a secondary reporting or whatever that is, but I can also see some in the current pay structure the difficulties there are if you impose a erm preceptorship on an individual and stop them from progressing we're also because they're on that preceptorship and not classed as independent

TS mm

P6 then you're at risk of losing them

TS mm

P6 so I think that's probably coloured my view over the years which is why we let them progress but keep our eye on them and have an individual plan

TS so it's more of an individualised

P6 yea

TS support, as needed

P6 because some of the preceptorships I've seen in other professions, I'm thinking now of some of the junior doctors that I've seen when we do sort of training with them it's a bit box ticking, erm so just **cos** preceptorship's in place I don't see it as a fail safe, I feel that we've got in place is actually better, but if it was a structured preceptorship I'm not entirely against it

TS mm, do you think a structured preceptorship model would erm facilitate employability of a graduate sonographer for some trusts (34.01)

P6 yea I feel that, well some trusts have already put that in place

TS mm

P6 but from what I've seen locally, I'm not a big fan of those schemes that are in place but that doesn't mean to say that there couldn't be a good scheme

TS mm just not as rigid as tick box

P6 yes

TS ok thank you erm and can you tell me your thoughts on sonographer experience?

P6 sorry what did you mean actually

TS do you think it's important for sonographers to have **experience** or do you think it depends on individual sonographers?

P6 I feel, I feel it's erm I feel experience, let me think (pause) I think it depends what what they are going to deliver, so if they are delivering erm a general list then I think experience is important because somebody who hasn't got that experience won't have come across a lot of findings and they'll need a lot of advice whereas if you've got experience erm it's new things that you're not familiar with are few and far between

TS mm

P6 so for example somebody who's got twenty years experience will have seen most liver pathologies, most renal pathologies and will only need to be asking advice occasionally, a less experienced sonographer you've got to accept that they will need a lot more support

TS mm

P6 so experience is valuable there when planning your list, when planning your workforce you don't want all the lesser experienced people in one place so I do think it's important in that but it wouldn't stop me from taking somebody who hasn't got much experience but I would make sure they've got the level of support required

TS mm

P6 does that answer your

TS yea it does thank you (35.39)

TS erm can you tell me your thoughts on the role of regulatory bodies like HCPC in employability. Do they think they've got a role to play in employability?

P6 well they have at the moment cos some trust put it on as a pre requisite before they erm are accept, you know, will, they won't interview people who aren't HCPC registered, but I don't think it has to be that way erm I suppose it's about your professionalism, about somebody, it is quite erm it is quite a threat to feel that you might be struck off if you do something unprofessional

TS mm

P6 so if that's not there anymore and you want to employ somebody and they haven't got, they're not under that umbrella it's about making sure there's something else in its place

TS why is that important

P6 it's important to protect the public erm, you know, we all know that anybody can set up with an ultrasound machine erm thankfully most of the people that deliver that are delivering non diagnostic scans erm there's still the issue of safety in terms of how they use the ultrasound erm and none of that's regulated erm (pause) my perception is that HCPC registration gives us, gives the public a bit of protection but I don't think the public know that

TS mm pause yea ok thank you so can you tell me your definition of professional identity

P6 oooo that's difficult, I've not really got one (laugh) erm (pause) you mean has a sonographer got a professional

TS well in general what do you think, if I said to you professional identity what would your definition be of it (37.57)

(pause)

TS what's important for professional identity?

P6 I'm really sorry I can't think of an answer

TS well do you think professional identity is linked to professional regulation?

P6 (pause) no, no, I don't, erm for example, most, the public don't know what a sonographer is, they don't know what a radiographer is erm they might know what a health care professional is erm

TS do you find that surprising or are you

P6 I'm not surprised, I'm disappointed I feel that erm you know it's always about doctors and nurses you know, whenever you hear about a trust and what they're doing it's all about doctors and nurses erm I feel, I don't know whether that's just because we're small in number in comparison or that we're very over arching against all, we deliver across all specialities I think that's part of the problem so we've not got an identity because we deliver obstetrics, gynaecology, orthopaedics so erm I think that's part of it, so I think there's a problem actually with, and I think that's why I'm having difficulty giving you an answer cos we haven't really got a professional identity, is what I feel

TS mm

P6 er certainly from the public and even within the specialities: for example I've had obstetricians call me a stonographer, we get called ultra sonographer or and I feel even people in the trust don't know the difference between a radiographer and a radiologist

TS mm

P6 so I think there's real problems with professional identity, so that's probably why I can't come up with a very good definition

TS how would we overcome that

P6 (pause) it's education but how that gets out there, we try and have it on our badge (laugh) (40.00) and and I think generally, you see people call us nurse don't they? they call you nurse, they don't know what to call you

TS mm

P6 erm (pause) I don't know how we overcome it

TS mm difficult

P6 mm (pause)

P6 we need to raise the profile I suppose it's more, is it about more, you know, having more of a voice, having more open days when they do: interestingly we are going to do one they're having a recruitment drive at this trust where we're looking at erm getting local people to work at the hospital and we are involved in that and we are going to do a bit on radiography and sonography and different things so maybe, it's maybe about, maybe it's more about getting into schools maybe it's about, and we do do some of that we deliver even to primary schools what X-rays are and who takes them so it's probably that sort of thing that needs to happen more

TS so more about professional promotion

P6 yea promotion

TS early on

P6 yea about the opportunities

TS mm

P6 that, and and what the role actually er entails

TS mm

P6 I don't think we're very good at it

TS no, ok thank you. So that concludes my questions so I'd like to thank you very much for taking part it's been really really valuable so just to reiterate that it'll be transcribed and anonymised erm there will be if you wanted to see a copy of the transcript you're quite welcome to and if there's anything that I need to query or follow up on I may contact you for a follow up interview or telephone follow up if that's ok as well

P6 sure

TS ok I'll just give the opportunity if there's anything else you wanted to add at this stage

P6 I can't think of anything now, I think if I saw the transcript I'll try and fill in the gap cos I was going to say something earlier and I lost my thread and when I see it, it'll will probably remind me of what I was going to say

TS ok yes that's fine, thank you very much

9.12 Appendix 11 - Example of memo writing

Presented as written at the time.

Example of an early memo (1st level)

Explore here about what it means to be a 'professional'. What is professional standing

P4 well that offers another issue in itself of it not being a registered profession which I think if I'm going to go down the route of this, for people to feel like their role was at an accredited level

TS mm

P4 presumably they'd want some sort of, I know they can have membership can't they

TS yea

P4 voluntary membership but that's not the same because otherwise we have this problem people calling themselves ultra sonographers and they haven't done erm you know, equal level qualifications or experience

TS mm

P4 so they're not, it's the case isn't it

TS yea

P4 you need the accreditation, erm so it's quite hard maybe going into a profession and there's not a standard cos it could undermine your professional standing I suppose

What is professional standing? Reference back to literature. What constitutes a profession or professional, there is some literature relating to this ? Gibbs. Why is being a member of a profession important. Perhaps this is something to follow up with other participants.

Is there a relationship between professional registration and accredited learning? Most 'professional' courses lead to registration in the UK, e.g. AHP But are there others that don't? What about ARPs? or medical technical/health science graduates? Why is registration important to people? Is this about the interests of public safety or is it about professional identity and belonging??

Example of a later memo (3rd level)

Achieving professionalism

A reoccurring theme throughout the data relates to protecting the profession. This is in many forms including possible bias towards the clinical area in which the participant works, being resistant to new models, professional attitudes and gatekeeping. Some of this overlaps with other categories for example, gatekeeping and being resistant to change. However, what does it mean to be a professional? Does this relate to professional identity? When asked what constitutes a professional and what is professional identity? Many participants struggle with the concept.

The initial memo on professionalism asks 'What is professional standing'? in relation to a comment from P4

P4 erm so it's quite hard maybe going into a profession and there's not a standard cos it could undermine your professional standing I suppose

This was subsequently followed up in a follow up interview to explore what was meant by 'professional standing'?

P4 (*long pause) it could be yes I suppose it's how other people interpret as well, but yes I suppose that's because, (pause) if someone says you're a sonographer or you're a radiographer there is at least within the professions if not externally completely, an understanding of what that means and that that is their professional identity*

So does this imply that professional identity, being professional relates to the perception of that particular profession by the profession itself and the public?

The key premise of Social Identity Theory is group belongingness to the group and intergroup behaviours which includes self categorisation (Willetts and Clarke, 2014). Membership of the group defines how you should act and behave (Hogg et al, 1995). Individuals are labelled as in group members holding the same views and attributes and are seen as parallel members (Stets and Burke, 2000).

Murphy (2009) relate this to radiographers has having both a 'front stage' and 'back stage' identities. The former relates to the public facing self and the latter to the inner personal self which is evident when they are out of the public eye. This public facing and personal identities has also been described in micro and macro levels. The macro level relates to the public face and identity of the profession and public perception, whereas the micro level is more individualised incorporating qualifications and knowledge associated with the

profession (Wackerhausen, 2009). Do sonographers have a weak ‘front stage’ presence and a low macro level or public facing identity? P6 also complained about the lack of appreciation of her role by other health care professionals within the Trust, emphasising this.

P6 we haven’t really got a professional identity, is what I feel

Why is this the case? P6 goes on to suggest it is about how this is probably as a result of the public and even other health care professionals not really knowing what a sonographer is and does. Their suggestion is that more promotion of the profession is required.

P6 so I think there’s real problems with professional identity, so that’s probably why I can’t come up with a very good definition

This concurs with P4’s definition of professional identity and being a professional of the public's perception and understanding of what the role involves. All participants asked seemed to struggle with the definition of a professional and professional identity and what it means to be a professional.

P5 o my goodness, professional identity, (pause) I suppose mine’s quite wide really err (pause) I don’t think well a bit back to before really I don’t think erm (pause) the old individual groups is going to last very much longer in that we all have erm I’m a sonographer but I inject and I have diagnostic and injection clinics so my identity is a bit woolly and we have nurses who do ultrasound

P5 so I think erm (pause) I don’t feel it’s particularly important to have a specific identity is that what you mean, a specific job titles or?

The pauses and hesitation here perhaps indicates the participant is thinking, in action reflection perhaps, as to what professional identity means to her. The explanation relates to a job title perhaps relating to her role and responsibilities rather than what the requirements are for professionalism. This could relate to Willetts and Clarkes' (2014) social identity theory of self categorisation as aforementioned. Self categorisation was first described in the 1980's by Turner and Hogg as expanding individuals understanding of the self and the collective (Turner et al, 1994). It is the individual's perception of the similarities of the group members and self (Stets and Burke, 2000). These groups could be the ‘old groups’ perhaps P5 refers to for example radiographer sonographers. Individuals are thought to have many categories of self categorisation at different levels of abstraction with the higher category level being more inclusive abstraction (in group) and the lower the level of category, the more exclusive the abstraction (out group), (Haslam, 2004). Haslam (2004) describes the three levels of self categorisation as superordinate or human level, intermediate or

social level and subordinate or personal level with authors advocating that each person has a unique combination of social categories to which they belong (Stets and Burke, 2000). The formation of in group and out group categories has been well documented as a group phenomena (Turner et al, 1987; Hogg et al, 1995; Stets and Burke, 2000 and Burford, 2012) of which depersonalisation is a basic process leading to the transition from an individual to a group member (Hogg et al, 1995).

These sub categories for the achieving professionalism category are structured around four of the 5 important aspects Downie (1990) of a professional -

- A well defined skills base underpinned by knowledge
- Being educated rather than trained
- Having a code of practice
- Being autonomous, accountable and freedom to act

1. A well defined skills base underpinned by knowledge

Sonography does not have the benefit of a clear code of conduct provided by a regulatory body which Gibbs (2013) identified as essential for professionalisation. Although not a regulatory body, the SCoR and BMUS (2015) recently published joint guidance relating to a code of conduct for sonographers which can be found here.

In the absence of professional standards, which McGregory et al (2009) advocates should be subject to regulatory and professional controls, the United Kingdom Association of Sonographers (UKAS 2008) published guidance standards with subsequent additions from the SCoR (2009) and as aforementioned, a more recent update published in December 2015. In addition, the SCoR and Royal College of Radiologists (2012) published joint guidance for ultrasound practitioners. This guidance and professional and regulatory standards, have an underpinning body of knowledge and research which should be continually reviewed and refreshed. Blane (in Adams and Smith, 2003) reiterates this and how it is an essential component of professional identity. Should one essential element of the definition of professional identity be missing, for example, the underpinning knowledge base, then this can lead to the profession being perceived as a semi profession (Friedson, 1970). In the past radiography has been accused of being a 'semi profession' due to the lack of research active radiographers (Adams and Smith 2003). In more recent years the SCoR have invested in increasing the research profile of the profession with the introduction of the consultant radiographers group and research group driving this agenda forward. The consultant radiographers grouped was established in 2006 and had only 23 consultant radiographers in post in 2007, which included 2 trainees (Snaith, 2007). More recent years have seen growth

in the numbers of consultant radiographers with a current constitution of 84 consultant diagnostic radiographers, however, only 15 are consultant sonographers (https://www.sor.org/career-progression/consultants/consultant-radiographer-group). A fundamental objective of this group is to promote research across the profession, as well as leadership, education and expert clinical practice.

To further increase and promote research within the profession, the SCoR established the research group in 2002 to assist in achieving its aim

> *'To promote study and research work in radiography and radiotherapeutic technology and allied subjects and to publish the results of all such study and research.'*

https://www.sor.org/career-progression/researchers/research-group

This group builds on the research skills developed as part of the higher education courses in radiography in the United Kingdom (UK) by

> *'encouraging all radiographers to use research in their practice and to engage in the research process, thereby establishing, refining and adding to radiography's unique body of knowledge.'*

It is recognised that the constitution of the SCoR group does not include any sonography representation, perhaps a reflection of the low numbers of consultant sonographers nationally.

2. Being educated rather than trained

In the late 1980's radiography education moved away from the traditional diploma level qualification to degree level education, enabling radiographers to enter higher education and gain the additional values associated with a graduate profession (Hogg et al, 2007). According to Downie (1990) this move from being trained to being educated is also associated with the move to being recognised as a profession. The establishment of a professional body and move to graduate education with underpinning research, reinforces the interpretation of a professional. The situation is mirrored in ultrasound where education moved from a Diploma to Masters level education, however, sonography currently lacks a professional body.

The current postgraduate training models in ultrasound only facilitate small numbers of trainee sonographers at any given time and a high proportion of these trainees are already counted towards upskilling the existing establishment rather than contributing towards a true increase in the workforce (SCoR, 2014; HEEM, 2013; SCoR, 2009 and Bates et al, 2003). Currently, there is a sonography workforce deficit of 11% nationally (Centre for Workforce Intelligence, 2012 and SCoR, 2011) with some regional shortages

as high as 20% in 2013 and 18% in 2015 (Health Education East Midlands (HEEM) Sonography Workforce and Education Development project data analysis, 2013 and 2015). A recent survey published by SCoR (2014) indicates that the national vacancy rate for sonographer posts is 18%, with 61% of departments carrying vacant posts. However, it is acknowledged that the response rate for this survey was only 28%. Health Education England recently commissioned the Centre for Workforce Intelligence (CfWI) to compile a report on the current workforce deficits which is expected in the Spring of 2016. Sonography remains on the Migration Advisory Committee Occupation shortage list (www.gov.uk).

The majority of sonographers are employed at either advanced or specialist practitioner level with the existing role being matched against the Agenda for Change band 7 profile in the Department of Health (DoH) review in 2008. This created a band 7 and above workforce with no clear onward career structure or progression routes.

This advanced practice workforce is supported by postgraduate education for ultrasound in England with only very small focused areas of practice, for example, Abdominal Aortic Aneurysm screening, being the exception to this. The educational level is acknowledged by some participants

P6 I think it's a bit about of 'well I had to do an MSc' or 'I had to do a post graduate diploma so why can't they'

P7 but the sonographer has got itself locked into this you can only do M level, masters level, advanced practice and there's now the difficulty of course is that you can't, we can't keep up with demand with the current M level entry requirements and certainly the current model

P6 (long pause) well it's because of the way it was made into a MSc and the fact that er well Masters level erm there's reporting as seen if you're reporting erm it's to do with the Agenda For Change mainly so because independent reporting is seen as a band 7 level band 7 skill erm they automatically get put on to that band 7 so there's nothing underneath

The reporting aspect of the sonographer role was undoubtedly influential in this matching. But does reporting automatically equate to advanced practice. P7 does not think so

P7 reporting persa I don't think necessarily means I report therefore I'm an advanced practitioner

and goes on to explain that in current practice there are cases were a lower

band practitioner reports on ultrasound examinations. This is evident in non radiographer sonographers, for example, midwifes and nurses.

P7 so it's really the profession accepting that you can report at band 6 and but we've never had any history of that,

Both local and national project teams have gained momentum recently in exploring different educational models and career pathways for sonography. One local example included the formation of a Sonography Workforce and Education Development group by a local education and training board. The aim of this group was to facilitate a collaborative approach to achieve defined objectives, including an exploration of different education models.

One objective of the Sonography Workforce and Education Development group was

> 'Undertake an exploration of alternative career structures /delivery model, incorporating mapping of functional activities to find an agreed solution for sonography service provision.'

(Health Education East Midlands 2013)

To address this functional mapping was undertaken to explore if there were any tasks currently performed by the present sonography workforce which potentially could be delegated to a lower band sonographer. These tasks could be considered more protocol driven technical work. However, this would then possibly jeopardise the 'professionalism' of the sonographer workforce if we consider Cole's (2002) belief that professional practice requires the utilisation of professional judgement which requires additional skills to those considered purely technical skills. There also seems to be resistance to the lower band sonographer, particularly at band 5.

P3 I'm open to ideas of course erm and if there is an idea out there that how it would work I'm happy to look at it but I think I'm not sure if we're doing the right thing if we're trying to build the workforce, I'm not sure if we're doing the right thing by saying lets just do it to a band 5 cos I'm not sure that how many people would be interested in that

P3 I'm thinking what department would support with a band 5 (pause) I think I think that's a bit harsh really to be fair

Could P3 be struggling to see a different kind of sonographer and equates the band 5 sonographer to the same as the current band 7 role just being on a lower banding. P7 and P4 concurs with this and identifies that band 5 sonographer would be a qualified sonographer on a preceptorship year perhaps

awaiting a band 6.

P4 you couldn't just have them step into a band 7 as a newly qualified not when other people have worked you know five seven years to get there, I think it would be devisive otherwise

This model is one being piloted by a UK University which is one of the outcomes from the Health Education England (HEE) Diagnostic Imaging project teams work. The National Sonography Working group was established by HEE to make recommendations in relation to the workforce implications arising out of the Working Group. Their main objectives centered around exploring strategies, including costs and implementation considerations, recommendations and communication. This work feeds into the Diagnostic Imaging project team's wider work which has recently gained momentum with several small commissioned projects exploring different options for education and the future sonography workforce, such as the one alluded to above. These findings are expected to be published in March 2016 following the CfWI report which was originally due to be published in January 2016 (now delayed until Spring 2016). However, there are concerns raised over the 'dulling down' of the existing role such as those voiced by P3 and P4.

One could argue that whatever training model is recommended the issue will remain of clinical placement capacity. Certainly, from the local project it was evident that this was inadequate due to the intensive hands on, face to face practice required. Attempts to supplement this with ultrasound simulation have been trialled and are currently being evaluated further. It is acknowledged that little research has been undertaken to date evaluating the effectiveness of ultrasound simulation in healthcare education (Gibbs, 2014; Dickson, 2015 and Gibbs, 2015). However, the positive impact on the student experience is recognised as is the increase in student's confidence when they subsequently attended the clinical placement (Gibbs, 2014; Martin, 2014 and Gibbs, 2015). Despite this some participants struggled to acknowledge the benefits.

P3 yea I think it's important previous experience
TS do you think that can be er taught in a different way? (8.00)
P3 no if I'm honest I think having some time in a clinical setting no matter what that setting is, having time just dealing with patients I think that's really valuable
TS yea so things like er change erm supplementing it or using simulation for example instead
P3 it's the interaction with patients that that people lack in if you're not careful

The majority of definitions for advanced radiographic practice rely on generic ideals and have been criticised for their lack of clarity (Price, 2005 and Snaith and Hardy, 2007). It is recognised that it is not the imaging modality but the

personal attributes that promote advanced practice, in particular self belief, motivation, inspiring others, commitment, autonomy and intellect (Hardy and Snaith, 2006: Snaith and Hardy, 2007 and Kelly et al, 2008). More recently, McInerney and Baird (2016) argue that these personal attributes also extends to critical thinking and educators face the challenge of preparing students to become critical thinking radiographers.

P6 is perhaps eluding to this in the statement relating to the complexity of cases which requires more critical thinking and autonomy.

P6 so where where the line between 5 to 6 and 6 to 7 is, is where we need to do more work I feel it's probably more about the complexity of what we're looking for erm but that's hard to predict from the referral

A few participants do question whether sonographers employed at band 8a are working at band 8a. Despite this they seem to accept without question that sonographers all work at band 7. Most struggle to identify roles that could be performed by a lower band sonographer.

P1 like there's areas that have got all their sonographers at a band 8a, now are they really working at a band 8a? That's the question

P3 well sonographers would like more! The experienced ones want an 8a

P4 perhaps there needs to be a review to see if that parity is still at the right level

P5 I understand the banding and I don't necessarily agree with some of the banding structures there are in that I think there's a lot of band 8a sonographers that don't do anything different than from band 7 and there's a lot of issues around banding the reason that we're all able to ask for a lot of money is because there aren't enough of us, they've made us too special, all of us

P7 there's some band 8a sonographers who are clearly are band 8a and there's some band 8a who have used some very imaginative terminology in the job description for the matching and sometimes a Trust will use 8a to try and poach sonographers from another neighbouring area

Does advanced practice and masters level education go hand in hand?? Check references.

3. Having a code of practice

Professionalisation is defined by Gibbs (2013) as having a trade union, members and a code of conduct they must adhere to. Applying these requirements to Sonography it becomes evident that the definition is 'fluid'.

Sonographers are not regulated by their own professional or regulatory body and there is heavy reliance for sonographers to maintain registration in their first professional area. For a high proportion of sonographers this is with the HCPC as a Diagnostic Radiographer and also with the Society and College of Radiographers as sonographers on their voluntary register. Undoubtedly, professional regulation is seen as an essential element for a workforce to be recognised as professionals and is often determined by its legal status, i.e. whether it is regulated. This creates ambiguity as sonographers are registrants in another profession other than sonography.

However, some authors such as Gibbs (2013) acknowledge that it is possible to achieve professionalism without formal recognition as is the current situation for sonography.

P5 relates professional identity to a code of conduct, however, there seems to be some confusion over what is meant by a code of conduct as she suggests they should all be the same. The final statement affirming she has no strong views on this again suggests professional identity is important.

P5 well I think I've always been certainly in this job, I've been outside my profession, outside the radiology professional erm identity and actually it has been very difficult because I've been managed by nurses who will say 'well you're a radiographer so I don't really know what to do with you'. Well code of conduct should be same wherever, you know, there are certain things that should be same no matter wherever you're in and I think sometimes this sectioning off is not helpful and not necessary because the code of conduct and things like that should be the same whatever erm so I don't have any very strong views and certainly wouldn't have any strong views to keep them segmented off

Is this because this participant works in a multi disciplinary team, outside the traditional radiology setting? This was further explored including the importance of inter professional education which had been raised as a possible development area for sonographers by one participant. However, when this was followed up, the participant contradicted herself after being probed to deeper think about this and offered examples of where sonographers where working as a member of a multidisciplinary team.

P7 I do, I think one of the problems that we have as sonographers is we have no professional identity we call ourselves sonographers and but we're not recognised as a profession and it is, it's one of the things that have caused the problems, or has been associated with the problem in that it hasn't even got its own professional code

P7 states sonographers have no professional identity and is partially attributable

to the lack of professional code. This participant also infers the lack of regulation and recognition of the term sonographer is a barrier for professional identity. P6 concurs with this

P6 I suppose it's about your professionalism, about somebody, it is quite erm it is quite a threat to feel that you might be struck off if you do something unprofessional

This raises the question again as to what constitutes a profession or professional and why is being a member of a profession important.

The HCPC argue that professionalism goes beyond professional behaviour and in a report published in 2011 of a commissioned study to explore professionalism and professional behaviour, they believe that professional identity has a greater role to play. This professional identity is then reinforced by performance and undertaking actions of a professional who historically, have been perceived as people with high social status and value (HCPC 2011). Achieving this status and subsequent professionalisation, is recognised to be more difficult for 'newer' professions than for those who are more established (HCPC 2011). Could this 'status' be related to or achieved by advanced practice? Back in 2000, Nightingale and Hogg were arguing that multi disciplinary working through advanced practice roles increased the status of the radiography profession (Nightingale and Hogg, 2003). In recognition of the additional or extended roles radiographers have embraced, the Society and College of Radiographers (SCoR) developed accreditation for advanced practitioners and invite radiographers to apply (Freeman, 2010 and Coleman, 2013). Applications are assessed according to the core functions of higher level practice (Department of Health, 2000) and must demonstrate 'expert' practice.

4. Being autonomous, accountable and freedom to act

It is also vital that the current sonography workforce are able to practice autonomously and McGregory et al (2009) advocate that professional recognition is key in this. They define professional recognition

> 'as the formal acknowledgment of an individual's professional status and right to practice the profession in accordance with professional standards, subject to professional or regulatory controls'
>
> (Page 316)

In their 2009 study, McGregory et al found that 26.3% of their respondents quoted professional recognition as important and the lack of it, a disincentive.

The job description for Radiographers includes a section titled 'Freedom to Act' and for a reporting sonographer (band 7) states

> 'Broad occupational policies. Accountable for own professional actions, including reporting: lead practitioner for specialist area.'

http://www.nhsemployers.org/~/media/Employers/Documents/Pay%20and%20reward/Diagnostic_and_Therapeutic_Radiography.pdf

Professional recognition is undoubtedly important and can be strengthened by clear group or professional boundaries. Hogg et al (1995) believe categorisation sharpens the group boundaries, however, the professional boundaries of radiographic practice have always been blurred (Nancarrow and Borthwick, 2005) and can be attributed to some extent to the historical context of the development of the profession. Professions are nonetheless, constrained by the historical and culturally embedded values and expectations of that profession (King and Ross, 2004). The need for radiographers to challenge traditional boundaries and roles is recognised both by the professional body and national policy. The SCoR (2009) support this view of changing responsibilities in their statement

> 'Consultant radiographers will challenge boundaries and inspire the future'.
>
> (page 5)

P6 also mentions breaking down professional barriers and the difficulties with this.

P6 it should be a good thing, it should be a good thing but it's the professional boundaries that prevent that because a lot of a lot of people I see and speak to just can't get past that in the current work force

P6 also elludes to the difficulties with breaking down professional boundaries

P6 so I feel that erm in terms of more higher areas then more consultant sonographers so why hasn't that happened I think that's mainly down to lack of funding and in some instances the erm the consultant radiologists not supporting it and not wanting to let go

Here they recognise that the radiologist is being protectionist of their role and reluctant to delegate roles to sonographers. Comparisons can be drawn to the current sonographer workforce being reluctant to delegate roles to a lower band sonographer. Relating back to the historical context of radiographer and radiologist, it is well documented that the workforce deficit of radiologists opened opportunities for non medically trained radiographers to take over some roles and tasks which were traditionally the remit of the medically trained radiologist. This facilitates advanced and consultant roles for radiographers for example, report writing and interventional procedures as radiologists delegate

these roles to radiographers. However, critics claim that advancement of roles should be focussed on service evaluation and improvements rather than delegation of what could be considered the more mundane or less desirable tasks to a subordinate group (Hardy et al, 2008).

Despite this some respondents spoke about the sonography profession being 'special' and having a louder voice due to the workforce deficits.

P4 F/U and also I mean although everybody is concerned about staff shortages, and also, you know, erm people's work life balance being over worked and RSI on the other side of it it's quite nice to be special and needed, sort of psychological point of view you could think well I'm going to be less special and needed if there's more people able to do what I do

P4 also remarks that

P4 because people are in a shortage profession they often have a louder voice

P5 concurs with this view and states

P5 they've made us too special, all of us

Being special also relates to their own area of clinical expertise and participants appear to be biased towards their own area of clinical interest or expertise; feeling special, being special? One participant (P6) who is the lead for general abdominal work infers this area requires greater skill due to the unknown nature of the likely finding of pathology.

P6 whereas the more general abdominal and gynae where you really don't know what you're going to get 'fishing trip' from a GP might be more difficult

P6 I think it's a bit about the professional, erm about them protecting their own work,

P6 or do you draw the line where they've had other imaging for example we get CT scans that show something and they want an ultrasound for correlation, well you wouldn't expect your band 5 to do that….would be a more senior person so there are some demarcations but without looking down each individual pathway and and indication, I think that's hard

P5's area of expertise is in MSK ultrasound and mentoring and their comments

P5 our new sonographer's gone off on maternity leave now for a year and we can't recruit locums cos it's a specialised post in rheumatology so erm that's

caused problems

In relation to training P5 says

P5 *I think there's an under estimation of the amount of time that it takes*

P5 it's a lack of time again in my opinion there's a lack of er lack of erm knowledge about what it takes to be a good mentor and it's assumed that and it's been assumed since we're radiographers, if we're radiographers we can teach radiography and if we're a sonographer, we can teach ultrasound, there are some excellent sonographers who are not excellent teachers and I'm sure they would say that and erm I think the role of clinical mentor is a very specific one and not everyone is good at it, that, so if they're not good at it and they don't like then they will not enjoy it and the quality will not be there on either side

P5 In our area even more so, with due respect to other areas, even more so in MSK it demands a knowledge of MSK disease, before or during and clinical work whilst you're doing the scanning

P5 I think these days both patients and clinicians er actually want more specialist specialisations, people with more skills and more experience erm so I don't think they should be general erm I think there are some that may be slightly easier than others erm (pause) it's very difficult, very difficult when you're OCD sonographers, to think of somebody doing a basic scan cos you just don't know what you're going to come up against.

When asked if they employ a new sonographer graduate P5 was quite clear the answer was no and gave the explanation that

P5 cos in our experience our areas it is even more specialised

P5 things coming in from GPs are completely unregulated erm well not just GPs actually, err stuff that was clinical diagnosis and now they want a picture of it and they're sending them for a quick scan and unfortunately they're sending them for quick scan to probably the most err err short, MSK is a massive shortage and people command a lot of money, and so it's becoming that way

P3 interview TS what do you think about, of other areas of ultrasound so like the abdominal say for example, do you think that's er

P3 for this trust if we were going to do it, it would be obstetrics because we don't have a lot abdominal work and our experienced sonographers now already say they don't get enough of it

P3’s areas of expertise is in Obstetrics.

P3 no I think the key things I’ve got out, the, so key things are the registration is erm taking somebody whose got no experience and then the pressure on the experienced sonographers they’re the three key things to me

Is P3 inferring that the experienced sonographers are more valued/special?? Is abdominal scanning and having access to it a ‘privilege' for the experienced sonographers?

Having a louder voice - see above relating to being special, more power, influence.